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RECENT ADDITIONS TO THE BRITISH APHID FAUNA. PART II.

By H. L. G. Stroyan, M.A., F.R.E.S.

Manuscript received 3rd February, 1954.
(Read 3rd November, 1954.)

(With 3 Plates and 3 Text-figures.)

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I. Introduction.

Since the first part of this paper was published (Stroyan, 1950) the number of additions to the British aphid fauna has increased so rapidly that it has been found expedient once more to begin the treatment of species with the genus *Dactynotus* Rafinesque, rather than to reserve for an appendix those species whose introduction to the British list should properly, had they been discovered or described sooner, have been recorded in Part I.

This rapid increase in the known British species of Aphididae is in large measure due to the great progress in the knowledge of the Western European aphid fauna due to the researches of the late Dr. Carl Börner of Naumburg, East Germany, and Dr. D. Hille Ris Lambers of Bennekom, Holland. Many of the species described as new by them in recent years have now been found to occur in Great Britain. Unfortunately in many cases the adequacy of the descriptions published by the late Dr. Börner has lagged behind the achievements of his experimental work, and his recent death has left no alternative to the somewhat laborious necessity of expanding his descriptions from new material. In some cases the lack of adequate descriptions of species has led to the danger of synonyms being created owing to difficulty in recognising the existence of a prior description. Where doubt exists in such matters it has been duly noted in the text.

Two apparently new species are described in the ensuing pages: these are *Dactynotus* (*Uromelan*) *riparius* sp. n. and *Aspidaphium cuspidati* sp. n.

II. List of Species Discussed.

A list of all the species discussed follows below.

1. **Dactynotus (Uromelan) riparius** sp. n.
2. *Macrosiphum weberi* Börner, 1933.
3. *Macrosiphoniella trimaculata* Hille Ris Lambers, 1938.
4. *M. ptarmicae* Hille Ris Lambers, *nomen nudum.*
5. *Acyrthosiphon emeri* Hille Ris Lambers, *nomen nudum.*
6. *Aulacorthum rufum* Hille Ris Lambers, 1947.
7. *A. palustre* Hille Ris Lambers, 1947.
8. *Nasonovia nigra* (Hille Ris Lambers, 1931).
9. *Cryptomyzus ballotae* Hille Ris Lambers, 1953.

10*a*. *C. galeopsidis* (Kaltenbach, 1843), ssp. *citrinus* Hille Ris Lambers, 1953.

10*b*. *C. g.* ssp. *dickeri* Hille Ris Lambers, 1953.

11. *C. korschelti* Börner, 1938.
12. *Capitophorus horni* (Börner, 1931).
13. *Myzus* (*Sciamyzus*) *cymbalariae* Stroyan, 1954.
14. *Ovatus menthastri* Hille Ris Lambers, 1947.
15. *Ovatomyzus boraginacearum* Eastop, 1953.
16. *Brachycaudus* (*Nevskyaphis*) *bicolor* (Nevsky, 1929).
17. *B. semisubterraneus* Börner, 1952, *nomen novum.*
18. *Sappaphis maritima* Hille Ris Lambers, *nomen nudum.*
19. *S. gallica* Hille Ris Lambers, *nomen nudum.*
20. *S. brancoi* (Börner, 1950), ssp. **rogersoni** ssp. n.
21. *S. sphondylii* Stroyan, 1952.
22. *S. aethusae* (Börner, 1950).
23. *S. kunzei* (Börner, 1950).
24. *S. apiifolia* (Theobald, 1922).
25. *Brevicoryne buhri* Börner, 1952.
26. *Rhopalomyzus poae* (Gillette, 1908).
27. *Rhopalosiphum luzulella* (Hille Ris Lambers, 1947).
28. *Schizaphis* (*Paraschizaphis*) *caricis* (Schouteden, 1906).
29. **Aspidaphium cuspidati,** sp. n.
30. *Pseudacaudella rubida* (Börner, 1939).
31. *Schizomyzus lindneri* Börner, 1950.
32. *Brachysiphum thalictri* (Koch, 1854).
33. *Aphis acetosae* Fabricius, 1775.
34. *A. ballotae* Passerini, 1860.
35. *A. brohmeri* (Börner, 1952).
36. *A. brunellae* Schouteden, 1903.
37. *A. chloris* Koch, 1854.
38. *A. commensalis* Stroyan, 1952.
39. *A. crepidis* (Börner, 1940).
40. *A. etiolata* Stroyan, 1952.
41. *A. klimeschi* (Börner, 1952).
42. *A. lambersi* (Börner, 1940).
43. *A. lamiorum* (Börner, 1940).
44. *A. mammulata* Gimingham and Hille Ris Lambers, 1949.

45. *A. podagrariae* Schrank, 1801.
46. *A. poterii* (Börner, 1940).
47. *A. ruborum* (Börner, 1932).
48. *A. sarothamni* Franssen, 1928.
49. *A. schneideri* (Börner, 1940).
50. *A. scorodoniae* Del Guercio, 1911.
51. *A. taraxacicola* (Börner, 1940).
52. *A. thomasi* (Börner, 1950).
53. *A. vaccinii* (Börner, 1940).
54. *Brachycolus cerastii* (Kaltenbach, 1846).
55. *Semiaphis pimpinellae* (Kaltenbach, 1843).
56. *Pterocomma tremulae* Börner, 1940.
57. *Plocamaphis görnitzi* Börner, 1940.
58. *Periphyllus californiensis* (Shinji, 1917).
59. *Chaetosiphella berlesei* (Del Guercio, 1904).
60. *Saltusaphis intermedia* Hille Ris Lambers, 1939.
61. *Calaphis minutissima* Stroyan, 1953.
62. *Tinocallis platani* (Kaltenbach, 1843).
63. *Pterocallis maculata* (von Heyden, 1837).
64. *Therioaphis subalba* Börner, 1949.
65. *Drepanosiphum gracilis* Börner, 1940.
66. *Trama rara* Mordvilko, 1908.
67. *Protolachnus bluncki* (Börner, 1940).
68. *P. brevipilosus* (Börner, 1940).
69. *Cinara laricicola* Börner, 1939.
70. *Cinaria montanicola* Börner, 1939.
71. *Anoecia pskovica* Mordvilko, 1916.
72. *Mimeuria ulmiphila* (Del Guercio, 1917).

Two appendices will be found at the end of this paper. Appendix A deals with further records now to hand of species dealt with in Part I, and with changes of nomenclature where these are applicable since the date of publication of Part I. Appendix B refers to two species originally described from Britain by Walker, but only recently recognised, and in consequence omitted from the Check-list of Kloet and Hincks (1945).

III. Descriptions of and Notes on the Species.

1. **Dactynotus (Uromelan) riparius** sp. n.

Colour notes.

Dark bronze brown. Head, antennae, thorax in alatae, siphunculi, cauda, apices of femora and tibiae, and tarsi black; tibiae for most of their length brownish yellow; bases of femora pale yellow.

Morphology.

Apterous viviparous female (Plate I, fig. 1): Body robust, elongate oval, 2·94 mm. to 4·11 mm. long, typical facies of genus. Antennae intensely black, flagellum (joints III–VI inclusive) from rather shorter to rather longer than body; joint III equal to a little

longer than processus terminalis, and a little longer than siphunculi, with (?13)16–29 rather protuberant small secondary rhinaria on basal half to (rarely) four-sevenths of joint; the rhinaria often very hard to count accurately owing to the intense blackness of the joint. Rostrum reaching almost to third coxae, apical joint not very long, a little longer than second joint of hind tarsi, with two lateral pairs of secondary hairs and a dorsal half ring of four hairs. Spinal and pleural scleroites rather small, not fusing to any extent one with another; antesiphuncular scleroites not fused into an antesiphuncular sclerite. Siphunculi from about one-fifth to three-tenths as long as body, black, cylindrical with a slight expansion at base, apical flange very small; reticulate over about apical one-sixth to one-fifth, remainder imbricate. Cauda blackish sclerotic, ensiform, with or without a slight constriction at about one-third its length, with 15–24 irregularly placed hairs laterally and dorsally. Eighth tergite with 4–7 hairs. Antennal, cephalic and body hairs stoutish, blunted apically, those on ant. III up to slightly longer than articular diameter of joint. First tarsal joints of all legs with 5 hairs.

Alate viviparous female (Plate I, fig. 2) (one specimen): Very similar to apt. viv. female, but antennae slightly longer, marginal sclerites developed on abdominal segments 2–5 inclusive, and joint III of antennae with 33–40 secondary rhinaria over its whole length.

Host plant records.—Crepis paludosa (L.) Moench., living in small colonies up the inflorescence pedicels.

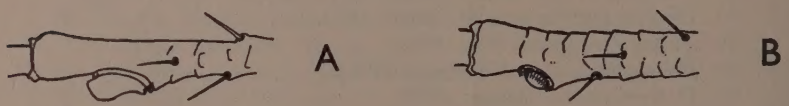

Fig. 1.—Apex of antennal joint V, with primary rhinarium, of (A) *Dactynotus* (*Uromelan*) *solidaginis* (F.), apt. viv. female; (B) *D.* (*U.*) *riparius* sp. n., apt. viv. female.

Habitat.—In both recorded localities the infested plants grew on the banks of small, fast-flowing stony streams, from which the specific name is derived.

Localities and material collected.—Type series (1 al. v. ♀, 9 apt. v. ♀) from banks of Crathie Burn, Crathie, Aberdeenshire, O.S. grid ref. (Scottish sheet 44) 258960, 6.vii.53.

Another series (4 apt. v. ♀) from between Loch Ard and Loch Chon, Stronachlachar road, near Aberfoyle, Perthshire, 9.vii.53.

Taxonomic notes.—No species of the subgenus *Uromelan* Mordvilko has hitherto been described from any species of *Crepis*. If the key to *Dactynotus* by Hille Ris Lambers (1939*a*) is used *D. riparius* will run down between *D. solidaginis* (F.) and *D. jaceae* (L.), but without agreeing in detail with the clues to either species. From the former it may be at once distinguished by the darker colour in life, and by the absence of the very characteristic enlarged and protruding primary rhinarium on the fifth antennal joint which is found in all morphs of *solidaginis* (fig. 1). From *D. jaceae* s.l. it is more difficult to distinguish. Many specimens of *jaceae* have a lower number of secondary rhinaria and caudal hairs than is given in Hille Ris Lambers' key; in fact the ranges of the biometric data for *jaceae* and *riparius* are closely approximate and show much overlap. The most reliable characters for separating *riparius* from the members of the *jaceae* complex are as follows:

riparius.	*jaceae* s.s.	*henrichi* Bör.	*aeneus* H.R.L.
Tibial shaft yellow, hardly darkened.	Tibiae markedly infuscate.	—	—
Apical joint of rostrum 0·16–0·18 mm.	Apical joint of rostrum 0·18–0·21 mm.	—	—
Secondary rhinaria on basal half of ant. III only (exc. rarely).	—	Secondary rhinaria to beyond middle of ant. III in nearly all specimens.	—
Hind femur less than half black.	Half or more of hind femur black.	—	—
Smaller, marginal tubercles, if present, no bigger than hair papillae.	—	—	Larger, marginal tubercles on abd. 2–4 rather conspicuous.

Measurements of specimens:

Body.	Ant.	Joint ratios (III–VI).	Siph.	Cau.	Cdl. hrs.	A.j.r.	2.h.t.	Rhin./III.
3·60	3·87	65 : 60 : 42 : 9 + 66	0·91	0·45	14	0·18	0·16	33 & 40 ?
		(Alate viviparous female, morphotype)						
3·98	3·49	64 : 49 : 37 : 10 + 58	0·98	0·59	22	0·18	0·16	22 & 29
		(Apterous viviparous female, holotype)						
2·94	3·09	57 : 46 : 33 : 7 + 50	0·80	0·46	21	0·17	0·14	17 ? & 14 ?
3·62	3·36	61 : 46 : 36 : 10 + 57	0·91	0·61	15	0·17	0·14	20 ? & 23 ?
3·94	3·60	64 : 53 : 37 : 10 + 61	0·98	0·61	19	0·18	0·14	– & 13 ?
3·36	3·04	57 : 41 : 33 : 9 + 50	0·77	0·51	19	0·16	0·14	13 ? & 15 ?
4·11	?	65 : 46 : 38 : ?	0·85	0·56	22	0·18	0·14	23 & 20
3·49	?	62 : 54 : 43 : ?	0·93	0·64	24	0·18	0·15	22 & 16
3·62	3·38	61 : 49 : 36 : 10 + 55	0·94	0·58	20	0·18	0·16	22 & 23
3·44	3·62	63 : 50 : 39 : 11 + 63	0·96	0·59	22	0·18	0·16	23 & 22
		(Above all type series, Crathie, 6.vii.53)						
3·28	3·22	60 : 42 : 33 : 10 + 56	0·81	0·50	15	0·18	0·14	13 ? & 13 ?
3·57	3·58	65 : 49 : 38 : 10 + 62	0·98	0·56	17	0·17	0·15	18 & 27
3·46	3·50	66 : 46 : 37 : 10 + 60	0·93	0·56	17	0·18	0·14	20 ? & 15 ?
3·20	3·50	66 : 48 : 36 : 10 + 59	0·96	0·58	17	0·18	0·15	21 & 16
		(Above 4 apterae from Aberfoyle district, 9.vii.53)						

All lengths in mm. Queried rhinarial numbers refer to antennae too black to count with certainty.

In spite of the slight nature of the morphological characters separating *riparius* from its close relatives of the *jaceae* complex it seems desirable to treat the former as a full species in view of the remoteness of the botanical relationship of *Crepis paludosa* to the *Centaurea* and *Cirsium* species inhabited by *jaceae* and its subspecies.

The type series of *D. riparius* is at present in the author's collection, but the holotype will ultimately be deposited in the British Museum (Natural History), South Kensington.

2. *Macrosiphum weberi* Börner, 1933.

Originally described (Börner, 1933) from *Succisa pratensis* in spruce forest near Mannheim, this species was later reduced by Hille Ris Lambers (1939*a*) to the status of a subspecies of *M. rosae* (L.). At the same time the latter

author gave *Scabiosa columbaria* as an alternative host plant, but himself expressed some doubt as to the identity of the apterous viviparae which he described, which had been collected from *S. columbaria* near Mentone. Subsequent finds by the present author in Sweden and Scotland on *Succisa* have shown that *M. weberi* is a good species separated from *rosae* by adequate morphological characters, and indicate that the specimens described and figured by Hille Ris Lambers were in fact *rosae* and not *weberi*. It appears likely however from a small sample found in 1948 in the University Museum of Zoology, Cambridge, that *Scabiosa columbaria* is a true wild host of *weberi* on occasions, though its typical habitat is on *Succisa pratensis* growing in boreal plant associations. An interesting feature of its biology is the fact that both in Sweden and Scotland I have found it attended by ants, while *rosae* has not been seen to be so attended.

M. weberi is a rather small, deep red species (Börner describes it as " dunkel violett ", and some examples, though not a majority, do approach this colour). It lives in small colonies up the flower stems of Devil's Bit Scabious. The size does not exceed 3 mm. long, and is not rarely as little as 1·8 mm. In the main it is very close to *M. rosae* (L.), which also frequently occurs on Devil's Bit as well as on other species of Scabious. However, the colour of the apterae and larvae is not a reliable guide to separate *weberi* from *rosae*; the same dark shiny violet red colour observable in *weberi* occurs also in many small apterae of *rosae* on *Scabiosa columbaria*, as does also the lilac greyish colour of the immature forms due to rather copious wax pulverulence.

Apterous viviparous female (Plate I, fig. 3): Generally similar to small specimens of *M. rosae*, but a much plumper and sturdier-looking species, not elongate and very slender as described by Hille Ris Lambers (1939*a*) for the specimens afterwards found to be *rosae*. The most reliable differences between the apterae of the two species may be found by comparing the ratios of body length to the lengths of the hind legs and the antennal flagellum. Of these ratios that of the body to the hind tibia gives the best discrimination. Owing to allometry it is not possible to give exclusive ranges of variation for this ratio over the total size ranges of both species; but over the observed range of overlap in body size (i.e. from approximately 2 to 3 mm.) the overlap of the body/hind tibia ratio is negligible, and over any small selected part of the body length range there is absolute separation in this ratio (see table).

TABLE I.—*Discrimination between apterae of* Macrosiphum rosae *(L.) and* M. weberi *Börner.*

Body length/hind tibia length.

Length of body.	Value of ratio for: *M. rosae.*	*M. weberi.*
2·00–2·50 mm.	1·12–1·22	1·45–1·64
2·51–2·70 mm.	1·19–1·33	1·49–1·69
2·71–3·00 mm.	1·33–1·49	1·68–1·73

The siphunculi in *M. weberi* are also usually considerably shorter relative to the body than in *rosae*, though this does not hold universally. However, they are almost invariably much more slender than in apterae of *rosae*, which latter have the siphunculi generally rather thickened right up to the proximal limit of the apical reticulate zone. This thickening is quite absent in *weberi*, and the thinness of the siphunculi over their apical half causes the apical flange to stand out more conspicuously than in *rosae*.

Measurements of three specimens :

(1) Body 1·93 mm., ant. flagellum 1·77 mm., flagellum joint ratios 28 : 20 : 20 : 7½ + 35, siph. 0·54 mm., cauda 0·26 mm., caudal hairs 12, apical joint of rostrum 0·14 mm., 2nd joint of hind tarsus 0·11 mm., secondary rhinaria on ant. III 7 and 10 (*Succisa*, Aberfoyle, Perthshire, 9.vii.53).

(2) Body 2·82 mm., ant. flag. 2·30 mm., flag. jt. ratios 38 : 27 : 26 : 7½ + 45, siph. 0·76 mm., cauda 0·43 mm., caudal hairs 12, ap. jt. rost. 0·16 mm., 2nd h.t. 0·13 mm., sec. rhin. on III 9 and 11. (*Succisa*, Dinnet, Aberdeenshire, 4.vii.53.)

(3) Body 2·69 mm., ant. flag. 2·63 mm., flag. jt. ratios 42 : 31 : 30 : 8½ + 53, siph. 0·78 mm., cauda 0·42 mm., caudal hairs 11, ap. jt. rost. 0·16 mm., 2nd h.t. 0·13 mm., sec. rhin. on III 15 and 17. (*Succisa*, Älvdalen, Central Sweden, 18.viii.48.)

(All lengths in millimetres.)

Alate viviparous female (Plate I, fig. 4): Not hitherto described, and perhaps only produced in early and midsummer, as all sexuparae seen so far are apterous. The morphology generally is similar to that of the apterae, but there is much less overlap in size with alatae of *rosae* in the material so far studied (5 specimens only). The ratio of body length to hind tibial length again provides a discriminant from *rosae* ; values of this ratio for alate *weberi* range from 1·62 to 1·73 mm., while for the total range of size studied in *rosae* the ratio varies from 1·27 to 1·56 mm., or between body sizes 2·8 and 3 mm. (the overlap zone) from 1·27 to 1·29 mm. The siphunculi are similar in shape to those of the apterae. Secondary rhinaria on the third antennal joint are fewer than in *rosae* in the five examples seen, numbering from 31 to 42 against 40 to 68 for *rosae* (Hille Ris Lambers, 1939*a*) ; but the intense blackness of the joint renders an accurate count difficult. One further useful character for diagnosis of *weberi* lies in the pigmentation of the fourth and fifth antennal joints, which in *rosae* are uniformly blackish ; in *weberi* the shaft of at least joint IV, and frequently also joint V, is much paler than the apex of the joint which is dark blackish.

Measurements of one specimen : Body 2·51 mm., antennal flagellum 2·17 mm., flagellum joint ratios 35 : 26½ : 25 : 8 + 41, siphunculus 0·61 mm., cauda 0·30 mm., caudal hairs 11, apical joint of rostrum 0·15 mm., 2nd joint of hind tarsus 0·13 mm., secondary rhinaria on ant. III 38 and 33. (Dinnet, Aberdeenshire, *Succisa*, 4.vii.53.)

Male.—Alate. Smaller than alate viviparous female, and with a very marked and extensive abdominal sclerotic pattern consisting of large marginal sclerites on 2–7 inclusive, that on 6 very large and uniting with the postsiphuncular ; transverse spinal bars across all segments, which unite laterally with the dark pleural intersegmental sclerites ; and large pairs of transverse pleural sclerites on the sternites. Antennae with joint III black sclerotic except at extreme base, bearing 35–43 rhinaria along its whole length ; joint IV pale except apex and extreme base, which are blackish ; joint V pale over basal half, darkening gradually to apex, with 7–11 rhinaria more or less in line ; VI all dark, with processus terminalis from about 5¾ to 7 times basal part. Joint IV, as in other species of *Macrosiphum* s.s., bears no rhinaria[1]. Siphunculi as in other forms, about as long as ant. IV. Cauda elongate, finger-shaped, with about 12 hairs. Legs as in alate female.

In the material examined (2 males of *weberi*, 3 of *rosae*) the males of *weberi* and *rosae* apart from the rather smaller size of the former, differ as follows : (1) males of *weberi* have many fewer rhinaria on ant. III than *rosae* (35–43 against 71–82) ; (2) joint IV of the antennae is quite pale in *weberi* over the basal 4/5, while in *rosae* it is brownish sclerotic, slightly darker towards apex ; (3) the body length : hind tibia ratio in *weberi* ranges from 1·54 to 1·60, in *rosae* from 1·21 to 1·35.

[1] The description of male *rosae* by Hille Ris Lambers (1939*a*) appears to be based on material of *Sitobion fragariae* (Walker), according to a single imperfect specimen kindly sent by him for examination. This is indicated by the reference to 10–25 rhinaria on ant. IV, and to a short triangular cauda, hardly longer than its basal width. Dr. Hille Ris Lambers writes in a letter that these males were taken copulating with oviparae of *rosae*, but adds : " I know now that in nature there is little discrimination in specific choice by the males".

Measurements of one specimen: Body 2·30 mm., ant. flagellum 2·40 mm., joint ratios $36\frac{1}{2} : 30 : 26 : 8\frac{1}{2} + 49$, siph. 0·48 mm., cauda 0·17 mm., caudal hairs 12, secondary rhinaria on III 43 and 41, on IV 0 and 0, on V 7 and 11. (*Succisa*, Dinnet, Aberdeenshire, ex cult. 24.ix.53, *M. W. Shaw* leg.)

Oviparous female: Three specimens from Aberdeenshire differ in some particulars from the description given by Hille Ris Lambers (1939*a*); the antennae are shorter than the body, and the processus terminalis is only about $4\frac{1}{4}$ to $4\frac{1}{2}$ times the basal part of VI, as against just over 6 times in Börner's material. Also the distinctive pigmentation character given by Hille Ris Lambers (processus pale basally) does not occur in my specimens. The number of secondary rhinaria on joint III is 10–21. In other respects there is good agreement.

Measurements of one specimen: Body 2·64 mm., ant. flagellum 2·30 mm., joint ratios $36 : 29 : 29 : 9 + 40\frac{1}{2}$, siphunculus 0·63 mm., cauda 0·32 mm., length of hind tibia 1·65 mm., secondary rhinaria on ant. III 21 and 11. (*Succisa*, Dinnet, Aberdeenshire, ex cult., 24.ix.53, *M. W. Shaw* leg.)

British distribution.—Apart from the material collected at Dinnet and Aberfoyle, a small sample of five specimens was found in 1948 among material collected by the late Mrs. M. D. Brindley. These five apterae were collected from *Scabiosa columbaria* (? referred to as " Lesser Scabious ") at Quy, Cambs., 9.viii.16. In spite of the apparent incongruity of this record the specimens proved to be within the biometric range of *weberi* and not that of *rosae*. Recent searches in this area have produced nothing but *M. rosae* on *Scabiosa columbaria*.

I am much indebted to Mr. M. W. Shaw of Marischal College, Aberdeen, for his active help in collecting material of *weberi* from the Dinnet locality.

3. *Macrosiphoniella trimaculata* Hille Ris Lambers, 1938.

This species from species of *Chrysanthemum* was fully described by Hille Ris Lambers (1938). It was found in some numbers by the writer feeding on the underside of the basal leaves of *C. leucanthemum* at Braithwaite, Cumberland, on 24.vii.52. It will almost certainly prove to be widespread.

4. *Macrosiphoniella ptarmicae* H. R. Lambers, *nom. nud.*

A distinct species recently discovered by Dr. Hille Ris Lambers on *Achillea ptarmica*. The description has not yet been published but will appear shortly. A single record of one aptera and one alata from *A. ptarmica* at Gleneagles, Perthshire, 7.vii.53 (*H. L. G. S.*) is all that is known of it as a British species at present. The identity has been confirmed by Dr. Hille Ris Lambers.

5. *Acyrthosiphon emeri* Hille Ris Lambers, *nom. nud.*

This as yet undescribed species from *Coronilla emerus* was found by Mr. V. F. Eastop in the University Botanic Garden, Cambridge, in 1951. It was at the time considered to be *A. caraganae* (Cholodkovsky). Pending the appearance of a description it is recorded here as a *nomen nudum*.

6. *Aulacorthum rufum* Hille Ris Lambers, 1947.

For the full description of this species see Hille Ris Lambers (1947*b*). Apterae resemble *A. solani* (Kaltenbach) strongly in mounted preparations, but the head is not spinulose dorsally. In colour the apterae when alive vary from apple-green to dark brownish-red. The host is *Vaccinium myrtillus*.

Apterae were thrashed by the writer from *Vaccinium myrtillus* growing on a stone wall near Balmaha, Stirlingshire, 8.vii.53. Some specimens have also been taken by Mr. J. P. Doncaster, and it seems probable that the distribution will be found to be coextensive with that of *Vaccinium myrtillus*.

7. *Aulacorthum palustre* Hille Ris Lambers, 1947.

For full description see Hille Ris Lambers (1947*b*). A single alata and nymph are recorded by Fidler (1953) from *Taraxacum* at Fulford Ings, Yorks., on 6.vi.49. No other British record is known as yet.

8. *Nasonovia nigra* (Hille Ris Lambers, 1931).

This species was not included in the first part of this list as no reliable records were then available. A subsequent investigation of the distribution of *Nasonovia compositellae* (Theobald) (Stroyan, 1953*d*) led to the finding of *N. nigra* in localities in Herts. and, later, Shropshire and Merioneth. A single aptera was also found on a dried herbarium specimen of *Hieracium peleterianum* from Craig Breidden, Montgomery, in the Herbarium of the Dept. of Botany, Cambridge University.

Information up to the present time shows that this species and *N. compositellae*, whose biology is completely similar but which has not yet been recorded outside Britain, have apparently rather different distributions. That of *compositellae* (Cumberland, West Riding, Caernarvon, Anglesey, Brecon) is clearly western, and agrees well with the main areas of distribution of endemic *Hieracium* populations. Records of *nigra* are more fragmentary, and it is perhaps unsafe to theorise from them; but the absence of records from the north of England, the occurrence of the species in the Herts. Cambs. border area and its penetration through Mid-Wales to the coast of Cardigan Bay well north of the most southerly record of *compositellae*, all suggest that *nigra* is a more recent arrival from the continental areas of *Hieracium* distribution. Natural *Hieracium* populations are rare in eastern England, and where they occur are often composed of apparently recently introduced forms. So far *compositellae* has not been found at all in the south and east; and in Mid-Wales, where the distributions of the two species overlap—or at least cross one another—no aphids have been found which could be regarded as in any way transitional from one species to the other. The single slight exception is a sample from the south of Merioneth, which, although clearly *N. nigra*, shows a slight tendency towards *compositellae* in the shortening of the processus terminalis. This might indicate the possibility of introgression from *compositellae* areas to the north, or might be simply a manifestation of the curious and unexplained phenomenon noted by Dr. Hille Ris Lambers, that aphids collected in maritime localities often show a shortening of the appendages compared with material from inland localities.

In any event, the picture afforded by these overlapping distributions without apparent intergrading is consistent with expansion of one or both ranges after speciation had occurred in isolation. Speciation through ecological isolation cannot be entertained in view of the identical habits and habitats of the two species. It is tempting to regard *compositellae* as a possible relict of an interglacial fauna. This, if so, would be a very unusual case among aphids, of a

distribution pattern imposed by happenings in geological time persisting to the present day, helped no doubt by the geographical isolation of the western British *Hieracium* flora from the continental. Much more data are required on the distribution of both species before such a hypothesis can be advanced with confidence; but it is at least compatible with the facts as known at present.

A northward extension of the range of *nigra* in Wales is indicated by information from Mr. A. W. Colling that fundatrices of this species and their progeny were found commonly at Bangor, Caerns., on 15.iv.45. The writer has not seen these specimens, but it seems possible that *compositellae* may have been the species involved here.

9. *Cryptomyzus ballotae* Hille Ris Lambers, 1953.

For full description and data see Hille Ris Lambers (1953). This new species from *Ballota nigra* and *Lamium album* is so far known only from Kent and Surrey. It has yet to be found on the continent.

10. *Cryptomyzus galeopsidis* (Kaltenbach, 1843).

ssp. *citrinus* Hille Ris Lambers, 1953, and ssp. *dickeri* Hille Ris Lambers, 1953.

These two new biological subspecies have been named by Hille Ris Lambers (1953) as a result of experimental work on *Ribes* aphids carried out by Dr. G. H. L. Dicker of East Malling Research Station. They pass their whole cycle without migrating, *citrinus* on *Ribes rubra* (*nigra* is specified by a *lapsus calami* in one line of the diagnosis) and *dickeri* on *R. nigra*. For further particulars see Hille Ris Lambers (*l.c.*).

11. *Cryptomyzus korschelti* Börner, 1938.

A full account of *C. korschelti*, which migrates between (1) *Ribes alpinum* and (2) *Stachys* spp., is given by Hille Ris Lambers (1953). He refers to material collected by Dr. G. H. L. Dicker from *Stachys* at East Malling, Kent; in addition to this record fundatrices and fundatrigeniae were found by Mr. V. F. Eastop and the writer on *Ribes alpinum* in the University Botanic Garden, Cambridge, in May, 1951.

12. *Capitophorus horni* (Börner, 1931).

This species lives holocyclically on *Cirsium oleraceum*. There is a subspecies *gynoxantha* Hille Ris Lambers, 1953, living on *C. arvense* and *C. lanceolatum*. A description and key for the separation of *horni* from the other *Capitophorus* species living on thistles (*carduinus* Walker and *elaeagni* Del Guercio) may be found in Hille Ris Lambers (1953). The same author includes Great Britain in the distribution of *horni* on the basis of material from "various British localities".

Kloet and Hincks (1945) list four species of *Capitophorus* as British: *hippophaes* (Koch), *flaveolus* (Walker) (synonyms *carduinus* (Walker) and *carthusianus* (Haviland)), *similis* Van der Goot and *chrysanthemi* Theobald. A fifth species, *inulae* (Passerini), is erroneously placed in *Ovatoides* Börner through confusion with *inulae* Walker. The type species is wrongly given as *flaveolus*; it is in fact *carduinus*. Following Hille Ris Lambers (1953) the following changes are required in *Capitophorus* of Kloet and Hincks:

C. flaveolus K. and H. nec Wlk. = *C. carduinus* (Walker).
C. carthusianus (Haviland)[2] = *C. elaeagni* (Del Guercio).
C. chrysanthemi Theobald. = *Pleotrichophorus c.*
Ovatoides inulae (Passerini) = *Capitophorus i.*
Capitophorus horni (Börner) is added.

13. *Myzus* (*Sciamyzus*) *cymbalariae* Stroyan, 1954.

Described originally (Stroyan, 1954) from collections made at Cambridge on *Cymbalaria cymbalaria*, this species was subsequently found to be widespread on a number of tufted perennial plants growing on walls or rockeries around Cambridge, and a large sample was found which had been collected in 1950 from *Cerastium tomentosum* on a wall at North Berwick, East Lothian. Other recorded hosts are *Sagina procumbens*, *Achillea serbica*, young *Urtica urens* (Hille Ris Lambers, *in litt.*) and young grass.

Further localities not as yet having been recorded, it is worth adding that in October, 1953, the species was detected on *Cymbalaria* growing out of the old wall of Merton College in Christchurch Meadow, Oxford. The species is almost certainly widespread, but overlooked owing to its cryptic habits and the apparent extreme rarity of its alatae.

14. *Ovatus menthastri* Hille Ris Lambers, 1947.

Described first (Hille Ris Lambers, 1947*a*) from *Mentha sylvestris* and *Mentha* sp. at Wageningen, Holland, and Merano, Italy ; but with the additional note " has probably also been recorded from England, under other names ". Börner (1952), as if in confirmation of this, synonymises the species with *Siphonophora menthae* Buckton, 1876. This appears to be a possibility, in which case *menthastri* is not strictly a new British species. However, there seems to be sufficient doubt as to whether *menthae* Buckton is really *menthastri* or the migrating species *menthae* Walker to justify retaining *menthastri* H. R. L. for the time being, and authenticating its British status by reference to specimens collected from *Mentha viridis* in the Botanic Garden of Cambridge University by Mr. V. F. Eastop on 17th November, 1950, and others recorded by Dr. J. H. Fidler from Fulford, Yorks, on garden mint, 25th August, 1947. For a full description of the species reference may be made to Hille Ris Lambers (1947).

15. *Ovatomyzus boraginacearum* Eastop, 1952.

Described from material collected from *Anchusa capensis*, *Pentaglottis sempervirens* and three species of *Symphytum* in the Botanical Garden, Cambridge University, between October, 1950, and January, 1951, and again in September, 1952 (Eastop, 1952). The species continues to occur in the type locality, but no further distributional records are available.

16. *Brachycaudus* (*Nevskyaphis*) *bicolor* (Nevsky, 1929).

Originally recorded from Central Asia (Nevsky, 1929) on *Lindelofia anchusoides* ; subsequently found by Shaposhnikov and Narzikulov on *Cerinthe*

[2] By a *lapsus* Hille Ris Lambers twice writes *carthusianorum* in his list of synonyms.

minor and *Codocephalum grande* respectively in the U.S.S.R. (Shaposhnikov, 1950*a*). The genus *Nevskyaphis* was erected for *bicolor* by Shaposhnikov (1950*a*) on account of the presence of conspicuous spinal tubercles on the pronotum and abd. 6–8. Börner (1952) considers this insufficient for a generic separation, and regards *Nevskyaphis* as a synonym of *Brachycaudus* Van der Goot. It is used here tentatively as a subgenus.

The following notes are based on material found at Great Wilbraham, Cambs., on *Cynoglossum officinale* on 28th May, 1952. The aphids lived basally and on the upper part of the taproots attended by *Lasius niger*.

Colour notes.—Apterae shiny yellowish tinged with pink, to pale green; siphunculi pale straw yellow. Abdominal dorsum with a shiny black central sclerotic area. The whole with a close resemblance to apterae of *Brachycaudus cardui* (L.). Bred alatae dark green in colour, siphunculi black.

Morphology.—The relationship to *B. cardui* is close. The pair of rounded mesosternal tubercles characteristic of the *cardui* group is found also in *bicolor* apterae. The antennal and body hairs are minute, the spiracles, apart from those of abd. 7 which are reniform, are widely open and subcircular, and the sclerotisation of the dorsum agrees very closely with that of *cardui*. The distinctive features of the species are the rather short, thick antennae, the shortish, pale, smooth, tapering siphunculi of the apterae, the variable presence in both apterae and alatae of spinal tubercles on the pronotum and abd. (6) 7 8 (though these are not infrequently absent), the presence of conspicuous marginal tubercles from the pronotum to abd. 7 inclusive (sometimes absent on meso- and metathorax) and the distribution of secondary rhinaria on the antennae in alatae. These have rhinaria on the third and fourth joints, while *B. cardui* (L.) has rhinaria only on the third, and *B. semisubterraneus* Börner on the third to fifth inclusive. Apart from this the alatae also lack the pleuroventral sclerites found on the posterior abdominal segments in *cardui* and *semisubterraneus*.

Measurements of single specimens:

Apt. vir. female: Body 2·32 mm., ant. flagellum 1·10 mm., joint ratios 21 : 12 : 10 : 7 + 19, siphunculus 0·26 mm., cauda 0·11 mm., caudal hairs 6, apical joint of rostrum 0·18 mm., secondary hairs on ap. jt. rost. 10, 2nd joint of hind tarsus 0·13 mm., chaetotaxy of 1st tarsal joints 3, 3, 3.

Al. vir. female: Body 1·86 mm., ant. flagellum 1·21 mm., joint ratios 21 : 13 : 9½ : 6 + 26, siphunculus 0·25 mm., cauda 0·11 mm., caudal hairs 5, apical joint of rostrum 0·18 mm., secondary hairs on ap. jt. rost. 11, 2nd joint of hind tarsus 0·13 mm., secondary rhinaria on III 35 and 37, on IV 7 and 5.

(Both specimens, from *Cynoglossum officinale*, Great Wilbraham, Cambs., 28.v.52, in the writer's collection.)

17. *Brachycaudus semisubterraneus* Börner, 1951.

This name was proposed by Börner (1951) for a species hitherto called by various authors *Anuraphis masseei* Theobald, *Brachycaudus prunicola* Kaltenbach) and *Anuraphis persicae-niger* (Smith). The grounds for this are, briefly, that the first and third names above both refer to a brown *Brachycaudus* species typically living more or less below ground on roots and suckers of peach, and which is now known as *persicaecola* Boisduval, 1867, while the second, *prunicola* Kltb., truly refers to a species of *Appelia* Börner living on *Prunus spinosa*. This, according to Börner, leaves without a name the brown *Brachycaudus* living, with similar biology to *persicaecola* Boisd., on *Prunus* species. This he renames *semisubterraneus* to replace the erroneous application of *prunicola* Kltb. The position is stated here without prejudice to the question

of whether it is desirable to make full species of *persicaecola* and *semisubterraneus*. Inasmuch as both forms occur in Britain, although neither is new, the new name creates an additional British species, and Börner's action is accordingly recorded here. A key for the separation of French species of *Brachycaudus*, including the two above-named species, is given by Remaudière (1952). From this the following diagnosis may be derived :

Ant. III twice as long as distance between antennal bases. Hairs on 8th abd. tergite much longer than cephalic hairs, from one-sixth to half the interantennal distance in length. Dorsal sclerotic shield reaching or including the marginal tubercles . . . . . **semisubterraneus** Börner

Ant. III not more than 1·6 times interantennal distance in length. Hairs of eighth tergite as short as cephalic hairs, less than one-twentieth interantennal distance in length. Marginal tubercles on independent marginal sclerites, not fused into dorsal sclerotic shield . . . **persicaecola** Boisduval

Börner (1951) refers to differences in the summer habits of *persicaecola* and *semisubterraneus* ; the former is said to prefer the twigs of peach, and to infest the leaves only when over-population occurs, while the latter infests the tips of plum and sloe suckers, and regularly infests the leaves, which are somewhat deformed by its activities.

18. *Sappaphis maritima* Hille Ris Lambers, *nom. nud.*

This small species, belonging to the section *Sappaphis* sensu stricto, will shortly be described by Dr. Hille Ris Lambers, and is included here with his agreement as a *nomen nudum*. Its life cycle is passed holocyclically on *Plantago maritima* and *P. coronopus*.

Since Dr. Hille Ris Lambers first apprised the writer of the discovery of this species it has been recorded from coastal localities in three British counties : Sheringham and Holme-next-the-Sea in Norfolk, Portland in Dorset and Ellenglaze in Cornwall. The Cornish specimens were swept from herbage in a marsh, and probably originated from *Plantago maritima* (*C. T. Gimingham*) ; the remaining material was obtained by thrashing *P. coronopus* growing on sand-dunes or sandy cliffs or shingle (*H. L. G. S.*). It will probably prove to be universally distributed round the coast of Britain in suitable localities.

19. *Sappaphis gallica* Hille Ris Lambers, *nom. nud.*

This species, like *S. maritima*, belongs in *Sappaphis* sensu stricto, and will be described shortly by Dr. Hille Ris Lambers. The alienicolae, which alone are known at present, inhabit *Cymbalaria cymbalaria*. Males and gynoparae are produced on this host in autumn, but the primary host has not yet been traced. Viviparae may be found on *Cymbalaria* up to midwinter.

The only British record at present known to the writer is a sample of five apterae and one alata collected from *Cymbalaria* at Cambridge on 24.xii.52 (*P. M. Naylor*).

20. *Sappaphis brancoi* (Börner, 1950).

Described by Börner (1950) as *Yezabura brancoi*, and later (1952) made by him the type of a new subgenus *Annaja* Börner. He recorded the species only from Central Germany, living heteroeciously on wild or cultivated apple and

Valeriana officinalis or *V. sambucifolia*. A synonym appears to be *Yezabura pomaria* Shaposhnikov, 1950, of which Shaposhnikov (1951) says that the basal half of the siphunculi is paler than the apical half, and that migration to Valerian is probable. It is not certain at present whether *brancoi* or *pomaria* has priority.

This aphid was first found in Britain by Mr. J. P. Rogerson at Portinscale, Cumberland, in 1945. He recognised that it differed from *S. devecta* (Walker) in various particulars, but not surprisingly could not find any published description with which it agreed. In 1950 he showed his small material to the writer, who referred to it (Stroyan, 1950) as being possibly the true *communis* Mordvilko in Part I of this paper. *S. anthrisci* (Börner), referred to in the same place as "*communis*" of Börner, has since been found forming galls on apple in spring and transferred to *Anthriscus*; and the then unconfirmed statement by Börner that *lauberti* Börner and *angelicae* Koch are heteroecious from *Crataegus* has been proved correct in extensive free choice experiments performed with spring migrants derived from hawthorn in 1951.

In June, 1951 the writer, helped by much valuable information supplied by Mr. Rogerson, succeeded in tracking down *brancoi* to apple bushes growing in two marshy localities on the shores of Bassenthwaite Lake, from one to three miles distant from the original locality. Many deep purplish red galls were collected, and alatae emerging from these were successfully transferred to *Valeriana officinalis* and maintained in culture during the first half of the summer.

Dr. Hille Ris Lambers has recently pointed out that material of the Cumberland aphids sent to him by the writer differed very markedly in the lengths of the antennal, cephalic and body hairs from Thuringian material, including cotypes, in the late Dr. Börner's collection. He kindly sent this material for comparison with the writer's series; and a detailed examination of it and of a slide of fundatrigeniae from Slovakia sent by Dr. Pašek shows that other small differences exist between the British and continental forms of the species. In view of the identity of the biology these distinctions are considered to be indicative of not more than a subspecific status for the British form. I propose the name **rogersoni** ssp.n. for the British subspecies, in recognition of its discoverer.

The fundatrix of *rogersoni* forms a small pouch-like gall under the midrib of a young apple leaf, and lives alone in it, the progeny emigrating to form separate twisted roll-galls on the margins of other leaves like *S. devecta* and *S. anthrisci*. The galls of the second generation contain, in addition to winged nymphs, a number of intermediate forms giving rise to more or less alatiform apterae. These are of a different type from those of *devecta*, being less heavily pigmented (except for the antennae, which are usually dark sclerotic), having no sclerotic thoracic capsule or tendency towards its formation, and having the secondary rhinaria more or less markedly apical in distribution on the antennal joints, and becoming more and more abortive from apex basad on each joint. The apterous alienicolae on *Valeriana* are apparently all of alatiform facies, of a type suggesting a relationship with *Sappaphis ranunculi* (Kaltenbach). Material from *Valeriana* in the field should be submitted for a specialist opinion, since a second, monoecious species has recently been discovered on *Valeriana* by Dr. Hille Ris Lambers.

Alatae of *S. brancoi* may be easily distinguished from those of the other apple-infesting species by the exceptionally large number of secondary rhinaria on joints III–V of the antennae (77–129 on III, 36–67 on IV, 5–21 on V in spring migrants ; 100–104 on III, 34–55 on IV, 2–5 on V in gynoparae).

The marginal tubercles in *brancoi* are large and flat, particularly in the alienicolae, and there is a very constant pair on the seventh abdominal tergite (somewhat less constant in fundatrices).

The British subspecies *rogersoni* differs from the typical subspecies in three respects. First, the chaetotaxy of the body and antennae is very variable in length, and much longer in most cases than that of *brancoi* s.s. The latter has the hair length maxima on ant. III in apterae 11–12μ, in alatae 12–13μ, while comparable values for *rogersoni* are 14–43μ and 18–50μ. Maxima for abd. 3T are : *brancoi* s.s., apt. 8–12μ, al. 18μ ; *rogersoni*, apt. 12–55μ, al. 16–50μ. Maxima for abd. 8T are : *brancoi* s.s., apt. 22–54μ, al. 54μ ; *rogersoni*, apt. 68–93μ, al. 57–86μ. The normal length relationship between antennal and abdominal hairs in apterous *rogersoni* is for the hairs on the third abdominal tergite to be about half as long as those of the third antennal joint, but the variability of this ratio is very considerable, from about 0·38 to 1·40.

Second, the correlation between the degree of expression of the two main alatiform characters of the apterous fundatrigeniae is different between *brancoi* and *rogersoni*. These characters may be expressed as the length ratio of the body to the antennal flagellum (joints III–VI) and the total number of secondary rhinaria. In the material so far examined (five *brancoi* and nineteen *rogersoni*) *brancoi* s.s. shows a greater number of developed rhinaria than *rogersoni* for equal values of the body/flagellum ratio, or, in other words, a greater expression of rhinarial development in relation to increased antennal length. This difference when plotted on graph paper is a marked one, there being no overlap at all in the scatter diagram.

Thirdly, the pale base of the siphunculi, described by Shaposhnikov for *pomaria*, and occurring rather constantly also in continental *brancoi*, is not at all conspicuous in *rogersoni*, many apterae having uniformly dark siphunculi and hardly any a conspicuously paler base.

Börner's subgenus *Annaja*, containing also *bonomii* H. R. L. and *nevskii* Börner, seems unnatural and is not retained here.

The type of ssp. *rogersoni* is deposited in the British Museum (Natural History).

Measurements of single specimens :

Fundatrix : Body 2·99 mm., antennal flagellum 0·86 mm., joint ratios (flagellum) 25½ : 10 : 7 + 11, siphunculus 0·21 mm., cauda 0·14 mm., caudal hairs 5, apical joint of rostrum 0·14 mm., 2nd jt. hind tarsus 0·11 mm., longest hair on ant. III 14μ, on abd. 3T 21μ, on abd. 8T 89μ. (*Malus sylvestris*, Bassenthwaite, Cumbd., 7.vi.51.)

Al. viv. fem. (spring migrant) : Body 2·40 mm., ant. flagellum 1·94 mm., joint ratios (flagellum) 38 : 24 : 15 : 9 + 35, siphunculus 0·26 mm., cauda 0·13 mm., caudal hairs 8, ap. jt. rostrum 0·16 mm., 2nd jt. hind tarsus 0·14 mm., sec. rhinaria on III 115 and 114, on IV 41 and 48, on V 15 and 8, longest hair on ant. III 25μ, on abd. 3T 27μ, on abd. 8T 71μ. (Ex nymph, *Malus sylvestris*, data as for fundatrix.)

Apt. viv. female (fundatrigenia) : Body 2·29 mm., ant. flagellum 1·29 mm., joint ratios (flagellum) 26 : 15½ : 10½ : 6 + 22½, siphunculus 0·30 mm., cauda 0·11 mm., caudal hairs 9, ap. jt. rostrum 0·17 mm., 2nd jt. hind tarsus 0·13 mm., sec. rhinaria on III 7 and 9, on

IV 14 and 18, on V 3 and 2, longest hair on ant. III 28μ, on abd. 3T 14μ, on abd. 8T 79μ. (*Malus sylvestris*, data as for fundatrix.)

Apt. viv. female (*alienicola*): Body 1·96 mm., ant. flagellum 1·24 mm., joint ratios (flagellum) 25 : 14½ : 10 : 6 + 22, siphunculus 0·32 mm., cauda 0·11 mm., caudal hairs 8, ap. jt. rostrum 0·19 mm., 2nd jt. hind tarsus 0·13 mm., sec. rhinaria on III 5 and 5, on IV 15 and 18, on V 1 and 0, longest hair on ant. III 21μ, on abd. 3T 14μ, on abd. 8T 75μ. (*Valeriana officinalis*, in culture ex Bassenthwaite, Cumbd., 27.vi.51.)

21. *Sappaphis sphondylii* Stroyan, 1952.

Described (Stroyan, 1952) from specimens collected at bases of plants of *Heracleum sphondylium* growing on sandhills at North Berwick, East Lothian, in June, 1950. An unsuccessful attempt to re-find the species at North Berwick in 1953 was followed by its rediscovery on sandhills near Aberdeen by the writer in company with Mr. M. W. Shaw of Marischal College. Mr. Shaw subsequently collected oviparae in September, 1953, which he kindly gave to the writer. These, with the additional apterae and two alatae collected in July, enabled supplementary observations to be made on the systematic position and diagnostic characters of *sphondylii*. It is clear that the species is holocyclic on *Heracleum*, and, furthermore, that the postulated relationship with *S. aizenbergi* (Shaposhnikov) is a very close one, since the oviparae of *sphondylii* have secondary rhinaria on the third antennal joint like *aizenbergi*. The characters given for separation of *sphondylii* from *aizenbergi* (Stroyan, 1952) hold for the 1953 collections. The alatae have a distinctly higher range of rhinarial numbers on ant. III than those of *aizenbergi* (54–68 against 37–48); and they may be separated from those of *S. lauberti* (Börner) by the constant presence of paired marginal tubercles on abd. 7 (present in only very exceptional specimens of *lauberti*), the presence of 2–4 secondary rhinaria on V (0 or rarely 1–2 only in summer alatae of *lauberti*), and the same length relationship between the longest hairs on the third antennal joint and third abdominal tergite as described for the apterae. Oviparae are about as large as the July apterae, have 3–8 rhinaria on III and occasionally 1 on IV, and the hind tibiae are barely thickened at the base, with 5–13 sensoria often aggregated into small groups near the base, but sometimes scattered to beyond half the tibial length.

A character previously noted which has since proved more variable than was indicated by the type series is the number of secondary hairs on the apical rostral joint. This in the later material varies from 2–4, with 3 the most usual number.

Colour notes taken from the living apterae in July, 1953, indicate that there is a rosy mottling in the grey-green body colour which is absent from living apterae of *S. lauberti*. This agrees with Shaposhnikov's colour notes on *S. aizenbergi*.

The late Dr. Carl Börner suggested to the writer in a letter that *sphondylii* is close to or identical with his *Neanuraphis nevskii* (1940). He has subsequently published this opinion in the final supplement to his Central European Catalogue (Börner, 1953 : 488). This species was described from material collected in lower leaf bases of *Heracleum austriacum*, and hitherto is known only from Styria. The original description gives no clue to the correctness or otherwise of this synonymy, other than a reference to *large* marginal tubercles on the pronotum and abd. 1–7 in *nevskii*. The corresponding tubercles in *sphondylii*

are of not more than normal size. One may hope that a comparison of type material may be possible at some future date.

Measurements of single specimens of the hitherto undescribed alatae and oviparae are given below.

Al. viv. female : Body 2·03 mm., ant. flagellum 1·47 mm., joint ratios (flagellum) 34 : 16½ : 12 : 8½ + 21, siphunculus 0·19 mm., cauda 0·10 mm., caudal hairs 6, apical jt. rostrum 0·18 mm., 2nd jt. hind tarsus 0·14 mm., sec. rhinaria on ant. III 66 and 68, on IV 17 and 18, on V 3 and 2, longest hair on ant. III 30μ, on abd. 3T 16μ, on abd. 8T 64μ. (*Heracleum sphondylium*, Aberdeen, 3.vii.53).

Ovip. female : Body 1·79 mm., ant. flagellum 0·80 mm., joint ratios (flagellum) 15 : 7½ : 7 : 5 + 15½, siphunculus 0·18 mm., cauda 0·09 mm., caudal hairs 7, ap. jt. rostrum 0·17 mm., 2nd jt. hind tarsus 0·13 mm., secondary rhinaria on ant. III 6 and 8, on IV and V none, longest hair on ant. III 32μ, on abd. 3T 18μ, on abd. 8T 61μ. (*Heracleum sphondylium*, Aberdeen, 21.ix.53.)

22. *Sappaphis aethusae* (Börner, 1950).

Formerly included in the wider sense of *crataegi* Kaltenbach. Börner published *aethusae* as a new species in 1950, having performed a migration test with alatae derived from *Crataegus* in 1948. The writer repeated this test independently in 1951 and 1953, and thus confirmed the objective reality of the form heteroecious between *Crataegus* and *Aethusa cynapium*. The 1953 tests showed in seven replicates that *Caucalis anthriscus* is an alternative summer host for *aethusae*. Morphologically the species is very hard to separate from *crataegi*. Spring galls on hawthorn are blood-red. The derived alatae have on the whole a more extensive dorsal sclerotic patch than alatae of *crataegi*, but this is a very small and indefinite character which cannot be relied on for purposes of identification. Börner (1950) gave two characters for the separation of *aethusae* from the other two *crataegi*-group forms, *crataegi* s.s. and *kunzei* Börner. One of these characters was the absence in *aethusae* of dorsal wax powdering, which is more or less pronounced in the other two forms. The writer has reared hundreds of apterae of *aethusae* in the insectary during 1951–3, and obtained gradations of wax powdering among them ranging from almost glabrous to quite coarsely pulverulent. The other character quoted is the length range of the processus terminalis (0·17–0·32 mm. in *crataegi* and *kunzei*, 0·33–0·39 mm. in *aethusae*). An examination of British apterae (71 *aethusae*, 38 *crataegi* and 38 *kunzei*) showed that the absolute length ranges of the processus in the three forms are virtually identical (*aethusae* 0·23–0·36 mm., *crataegi* 0·24–0·36 mm., *kunzei* 0·22–0·36 mm.) for apterae collected in the field. However, in order to test the possibility of differences in the length relationship of the processus to the basal part of VI, scatter diagrams were plotted for these apterae in which the ratio of the body length to the total antennal flagellum length was plotted, firstly against the body length itself and secondly against the processus/base of VI ratio. Slight but definite degrees of correlation were observable in both diagrams, the slope of the optimum regression line in each case being about the same. The points attributable to the three species were so much interspersed that all three species could be regarded as forming parts of a single range of variation for these ratios. However, small but significant differences were observed in the overall distribution of the points for the different forms, *aethusae* lying towards the upper

left hand limit of the P.t./VIb : B/F diagram, *crataegi* towards the lower right hand limit and *kunzei* being uniformly distributed over the whole range of the diagram. Such differences were much less obvious in the body length : B/F ratio diagram. Now since the latter diagram gives a measure of allometry in the relationship between the body and antennal lengths, and the former expresses the effect of increasing alatiformity on the P.t./VIb ratio, it would seem that there is some slight separation between the three forms on the basis of their tendency to produce alatiform apterae. Some support for this view is given by the development of the dorsal sclerite pattern in apterae, those of *aethusae* tending to have much more extensive tergal bands on the fifth to eighth abdominal tergites than those of *crataegi*, while those of *kunzei* show a mean range of expression for this character.

From the foregoing facts it may be concluded that *aethusae* and *kunzei* are biological realities which are at present not morphologically separable to a degree consistent with full specific rank, and are best regarded as subspecies of *crataegi* Kltb.

Rearing and transference experiments during the past three years have shown that in some years *S. aethusae* is the most abundant *crataegi*-group aphid in the Cambridge area, and the writer has also collected it on *Aethusa cynapium* in the Isle of Thanet. It is probably universally distributed.

23. *Sappaphis kunzei* (Börner, 1950).

See remarks on this form under *S. aethusae* (Börner). It is distinguished by Börner (1950) from *S. crataegi* (Kaltenbach) on the colour of nymphal fundatrigeniae, which in *kunzei* are said to be pale green, in *crataegi* reddish. The writer has been unable to confirm this from British material. The alatae of *kunzei* do however exhibit one character not found in *crataegi*, in the breaking up to a greater or less degree of the dorsal dark patch by intersegmental lines of weakness. This breaking up is noticeable in nearly all wild-collected material of *kunzei*, and does not appear to be correlated with reduction in size or depth of pigmentation, as is occasionally seen in dwarf specimens of other forms.

S. kunzei is apparently a less common aphid than either *crataegi* or *aethusae*, but occurs with some frequency and sometimes abundantly in the Cambridge and Newmarket areas, where its summer host, *Pastinaca sativa*, is a widespread and abundant roadside weed.

24. *Sappaphis apiifolia* (Theobald, 1922).

Theobald originally described this species from North Africa, and was apparently unaware of its occurrence in Britain. It may be assumed, however, that references by Davidson (1925) to the occurrence of *Anuraphis lappae* (Koch) on celery in Cambs. and Kent, and originating from Theobald's own "List of the Aphididae found in Kent" (Theobald, 1911), in fact apply to this species and not to the true *lappae* which is very rare in Britain, and certainly does not occur on Umbelliferae.

Börner (1950, 1952) identified this aphid with *Aphis inculta* Walker; but, as has been pointed out elsewhere (Stroyan, 1953*c*), such an identity is extremely improbable for biological reasons, and the first name of unquestionable validity is *apiifolia* Theobald. A further apparent synonym is *ferruginea-striata*

Essig, though there is a possibility that this race may be becoming differentiated from the Old World form.

In temperate Europe *S. apiifolia* forms red leaf galls in spring on *Crataegus*, and flies from these to *Apium*, *Petroselinum*, *Smyrnium*, *Conium* and *Levisticum*. The first two are the common hosts in Britain ; Börner (1950) regards the forms on these and on *Levisticum* as separate subspecies, but the writer has failed to obtain experimental confirmation of this for *Apium* and *Petroselinum*. *Smyrnium* is occasionally infested in the wild state ; *Conium* is apparently a typical host of *ferruginea-striata* in California, where the species is anholocyclic. In North Africa *Apium graveolens* and *Foeniculum vulgare* are typical hosts, and here again the species appears to have no primary host.

S. apiifolia differs from the other members of the *crataegi* complex by the very short hairs of the head and eighth abdominal tergite (these hairs in *crataegi* s.l. are considerably longer than the antennal and other body hairs), by the frequent presence of up to 5 secondary rhinaria on ant. V in alatae (*crataegi* s.l. usually has none), by the large flat marginal tubercles, and the presence of at least one such tubercle on the seventh abdominal segment in about 95 per cent. of specimens (more than 75 per cent. of *crataegi* s.l. have none on abd. 7).

The foregoing characters are typical of material collected on secondary hosts, and also of a large proportion of those collected from galls on hawthorn in the spring. However, a fair number of the latter appear to lie between *apiifolia* and *crataegi* s.l. in their morphology, and it is thought that these may represent the progeny of autumn crossing between the two species. The fact that such intermediates do not appear to persist during the summer on secondary hosts is consistent with such a possibility, which it is hoped to test experimentally. Material of *ferruginea-striata* Essig from California exhibits minor differences from British *apiifolia* in the size of the apterae, which are considerably larger than most European material, and in the percentage incidence of marginal tubercles on abd. 7, which are only rarely paired and very frequently absent in *ferruginea-striata*. Otherwise the two forms agree closely, and these small divergences may be the result of anholocycly coupled with geographical isolation in the American population.[3]

The body length, body/antennal flagellum ratio and processus terminalis/VI base ratio data for *apiifolia*, when plotted on scatter diagrams with those of the *crataegi* s.l. forms, show a very extensive overlap, as might be expected ; but the slope of the body length : B/F ratio regression line is somewhat less steep in *apiifolia* than in *crataegi* s.l. ; and while the slope is similar in both species for the regression of P.t./VIb on B/F, the overall distribution of points shows a lower range of values for P.t./VIb in *apiifolia* than obtains for corresponding B/F values in *crataegi* s.l. These regressions, though only rough approximations fitted to rather widely scattered observations, support the impression derived from other data that *apiifolia* is more deserving of full specific rank than either *aethusae* Börner or *kunzei* Börner.

S. apiifolia is a fairly common species, though much less so than *S. crataegi*

[3] Recent analysis of rhinarial distributions suggests that the holocyclic Northern European and anholocyclic Mediterranean species (including the American aphids) may be distinct sibling species, in which case the British form will be known as *petroselini* (Börner, 1950).

s.l. The writer has examined material from Cambridgeshire (frequent), Hertfordshire and the Isle of Thanet.

25. *Brevicoryne buhri* Börner, 1952.

Described by Börner (1952) from larvae and nymphs only, taken from dried herbarium specimens of *Barbarea stricta*! As a result the description is highly inadequate, but the following characters are given.

Size of adults estimated as up to 1·5 mm.; siphunculi very short, anteriorly little longer than their basal width; secondary rhinaria on III–V in alatae, 35–50, 5–8 and 3–6 in number respectively; processus terminalis fully three times as long as base of VI.

Mr. V. F. Eastop collected two fundatrices (one parasitised) and a single alata from *Barbarea vulgaris* in Berkshire in 1949 which Dr. Hille Ris Lambers considers to be referable to *buhri*. Thanks to him I am able to give the following data for these examples:

Fundatrix: Antennae 4-jointed, 5–8 secondary rhinaria at apex of III. Siphunculi mere thick-rimmed pores, situated at posterior margin of sixth abdominal segment. Cauda tongue-shaped, slightly angled apically, about seven-sixths as long as its basal width. Dorsal body hairs short, acute, regularly arranged, pleural series to abd. 5 inclusive. Legs and antennae blackish. Abdomen with sclerotic bars across seventh and eighth tergites only. Marginal tubercles on pronotum only. Eighth abdominal tergite with 5 hairs. Measurements of one specimen: Body 2·27 mm., ant. flagellum 0·51 mm., flag. jt. ratios 19 : 5 + 8, cauda 0·11 mm., caudal hairs 6, apical jt. rostrum 0·09 mm., 2nd jt. hind tarsus 0·10 mm., frontal hairs to 21μ, longest hair on ant. III 14μ, artic. diam. of III 14μ, secondary rhinaria on ant. III 7 and 8. (*Barbarea vulgaris*, Midgham, Berks., 14.v.49.)

Al. viv. female: Antennae 6-jointed, secondary rhinaria rather tuberculate, irregularly disposed along joints III–V inclusive. Siphunculi small, flangeless, nearly cylindrical, constricted to porus, hardly longer than wide at base. Cauda straight-sided triangular, with 5 hairs all very near apex. Complete sclerotic bars across abd. 7 and 8, broken ones from 3 to 6 inclusive. Marginal sclerites, each with only one hair, from 2–6 inclusive. Fore wings with media once-forked on one side, a very small 2nd fork the other, veins not darkened. First tarsal joints with 3, 3, 2 hairs. Measurements of specimen: Body 1·62 mm., ant. flagellum 1·25 mm., flag. jt. ratios 33 : 10½ : 7 : 6 + 21½, siphunculus not measurable, cauda 0·11 mm., apical jt. rostrum 0·10 mm., 2nd jt. hind tarsus 0·11 mm., longest hair on ant. III 11μ, artic. diam. of III 18μ, secondary rhinaria on III 54 and 56, on IV 11 and 9, on V 3 and 5. (*Barbarea vulgaris*, Midgham, Berks., 14.v.49.)

26. *Rhopalomyzus poae* (Gillette, 1908).

Originally described by Gillette (1908) from Blue Grass (*Poa pratensis*) in North America as *Rhopalosiphum poae*. In 1914 Börner described a species *Rhopalosiphum alpigenae* from *Xylosteum alpigenum* (*Lonicera alpigena*), migrating to *Glyceria fluitans*. In 1946 Dr. D. Price Jones discovered an aphid making large and conspicuous red and yellow speckled curl-galls on the leaves of a single bush of *Lonicera alpigena* growing in the Cambridge University Botanic Garden. Shortly before he left Cambridge he sent material to Dr. Hille Ris Lambers, who later wrote to the present author to say that he considered these aphids to be identical with both *poae* Gillette and *alpigenae* Börner. At his suggestion transferences were made by the writer in 1947 from *Lonicera alpigena* to *Poa pratensis* and *P. trivialis*. Both transferences

were immediately successful, and from the resulting material Dr. Hille Ris Lambers confirmed the identity of the two forms. *R. alpigenae* is therefore a synonym of *poae* Gillette. The species now falls into the genus *Rhopalomyzus* Mordvilko. A further find of the species was made by the writer in company with Mr. H. G. Morgan in Devonshire in 1949, on grass growing beneath a stone on a road verge; this material remains in Mr. Morgan's possession.

For a full account of the species reference may be made to Hille Ris Lambers (1953).

Exules of *poae* were collected by Mr. A. W. Colling from *Dactylis glomerata* tufts growing in crannies on a quarry face at Rhyd Wyn, Anglesey, on 6.iv.45. Viviparous overwintering appears to be indicated by this record. The aphids were examined by Dr. Hille Ris Lambers, who agreed with the identification.

27. *Rhopalosiphum luzulella* (Hille Ris Lambers, 1947).

This species, originally placed in *Longiunguis* on account of the twice-forked media and non-constricted siphuncular apex, has been removed by Börner (1952) to *Rhopalosiphum* Koch. The distinctions between the two genera are rather small if the rather distinct *pyrarius* Passerini (*streili* Börner, *Schizaphidella quinquarticulata* H. R. L.) is removed to *Geoktapia* Mordvilko; on the whole it seems desirable to follow Börner's placing. Even if he is not justified in sinking *Longiunguis* (erected by Van der Goot for *sacchari* Zehntner from the East Indies) as a synonym of *Rhopalosiphum*, it must at least seem doubtful whether a single detached representative should be assigned to the former genus in North temperate Europe, in face of the preponderant representation of the latter.

R. luzulella lives basally on *Luzula campestris* and *Luzula sylvatica*, under an earthen shelter erected by attendant ants. A full account of the species may be found in Hille Ris Lambers (1947).

The only known British records so far are (1) apterae and alatae collected on *Luzula sylvatica* at Bangor, Caernarvonshire, 7.v.45 (*A. W. Colling*) and (2) a single alata caught in a trap in Aberdeenshire, 11.vii.52 (*M. W. Shaw*).

Measurements of single specimens:

Apt. viv. female: Body 1·65 mm., antennal flagellum 0·75 mm., flagellar joint ratios 17 : 8 : 5 + 17, siphunculus 0·22 mm., cauda 0·12 mm., caudal hairs 5, apical joint of rostrum 0·08 mm., 2nd jt. hind tarsus 0·07 mm., hairs on eighth tergite 4.

Al. viv. female: Body 1·47 mm., ant. flag. 0·89 mm. (L) and 0·86 mm. (R), flag. joint ratios (L) 16 : 7 : 8 : $5\frac{1}{2}$ + 19, (R) $21\frac{1}{2}$: $7\frac{1}{2}$: $5\frac{1}{2}$ + $19\frac{1}{2}$, siph. 0·21 mm., cauda 0·11 mm., caudal hairs 6, apical joint of rostrum 0·08 mm., 2nd jt. hind tarsus 0·08 mm., hairs on eighth tergite 4, secondary rhinaria on III–V(IV) 6/3/1 (L) and 13/1 (R).

(Both from *L. sylvatica*, Bangor, Caerns., 7.v.45.)

28. *Schizaphis* (*Paraschizaphis*) *caricis* (Schouteden, 1906).

Hille Ris Lambers (1947*a*) separates two new subgenera *Paraschizaphis* (type *Toxoptera typhae* Laing = *Schizaphis scirpi* (Passerini)) and *Euschizaphis*, (type *Aphis palustris* Theobald) from *Schizaphis* Börner, sensu stricto. The characteristics of the former, to which *Aphis caricis* Schout. belongs, are the possession of long acute hairs on the antennae and abdominal dorsum, those on the dorsum being arranged in multiple transverse rows on the segments, and

the presence of 6–10 hairs on the eighth abdominal tergite. The alatae have numerous rhinaria on ant. III–IV, and sometimes a few on V.

Schizaphis caricis may be distinguished from its close relative *S. scirpi* (Passerini) by the shorter maximum length of the antennal hairs in apterae (those on III up to twice the basal diameter of III in *caricis*, to three times in *scirpi*) and by the larger number of secondary rhinaria on the antennae in alatae (*caricis* 12–20 on III, 6–12 on IV, 0–4 on V; *scirpi* 8–16 on III, 0–4 on IV, none on V).

Known British records at present are (1) apterae and alatae from *Carex ampullacea*, Llyn yr Wylfa, Merion., 13.vii.49 (*V. F. Eastop*), and (2) four apterae from *Carex* sp., near Rowardennan, Stirlingshire, 8.vii.53 (*H. L. G. Stroyan*).

Living apterae are dark shiny blackish-brown above, with a slight whitish wax bloom ventrally. The antennae and all but the bases of the femora are blackish; the tibiae are mainly pale with dusky apices. (Plate II, fig. 5).

Measurements of single specimens:

Apt. vir. female: Body 2·08 mm., ant. flagellum 1·10 mm., flag. joint ratios 18 : 10 : 11 : 7 + 23, siphunculus 0·27 mm., cauda 0·18 mm., caudal hairs 8, apical joint of rostrum 0·12 mm., 2nd jt. hind tarsus 0·11 mm., longest measurable hair on ant. III 32μ, articular diameter of III 21μ, hairs on eighth tergite 7.

Al. vir. female: Body 2·07 mm., antenna 1·18 + mm. (processus broken), joint ratios 20½ : 14½ : 13 : 7 + ? (19 +), siphunculus 0·26 mm., cauda 0·15 mm., caudal hairs 8?, apical joint of rostrum 0·13 mm., 2nd jt. hind tarsus 0·11 mm., hairs on eighth tergite 6, secondary rhinaria on ant. III 13 and 14, on IV 6 and 7, on V 3 and 3.

(Both from *Carex ampullacea*, Llyn yr Wylfa, Merion., 13.vii.49.)

29. **Aspidaphium cuspidati** sp. n.

Colour notes.—Apterae in life dark greenish-brown with dorsum and siphunculi blackish, legs and antennae uniformly brown sclerotic. Alatae dull green with blackish head and thorax. Immature forms dull brownish-green with posterior end of body between and around siphunculi tinged with reddish-brown.

Morphology.

Apterous viviparous female: Small, broad oval, body somewhat flattened. Head with frons convex, lateral prominences not developed. Antennae 5-jointed, fairly strongly imbricate; processus terminalis distinctly tapering, apex with two small setae, a third situated below these about 12μ back from apex. Primary rhinarium on IV small, deeply sunk. Antennal hairs small and fine, not more than about 7μ long. Compound eyes normal, triommatidion of moderate size. Rostrum short, about reaching mid coxae, apical joint normal, rather blunt, with one pair of very short secondary hairs on basal half. Dorsum of head and body entirely sclerotic and blackish except for the first two thoracic and last abdominal intersegments, coarsely sculptured with blunt bead-like spinules or papillae, especially prominent on the head and body margins, where they form hydrofuge tracts which retain an air film when the aphid is submerged in water. Air tracts are also situated across the thoracic intersegments and on a short mediodorsal line extending about halfway down the abdomen, on which the spinules are smaller and denser than over the rest of the middorsum. Ventral cuticle membranous, but ornamented with closely set transverse rows of very fine spinules. Siphunculi large, tapering, blunt horn-shaped structures, blackish; strongly and densely scabrous all over, with a small, inconspicuous preapical

porus on the *outer* side (in *jeschkei* according to Börner the porus is "innenseitlich"). Eighth tergite free from the dorsal sclerotic "shield", with 2 hairs. Cauda a little less than half length of siphunculi, blunt finger-shaped, a little constricted before the apex, with two pairs of very fine inconspicuous lateral hairs. Mesothoracic furca sessile, with a broad opening. Femora rather scabrous, hind tibiae slightly roughened at apex, tibial hairs thorn-like, sparse over basal two-thirds of tibiae. First tarsal joint chaetotaxy very difficult to make out, but apparently 3, 3, 2.

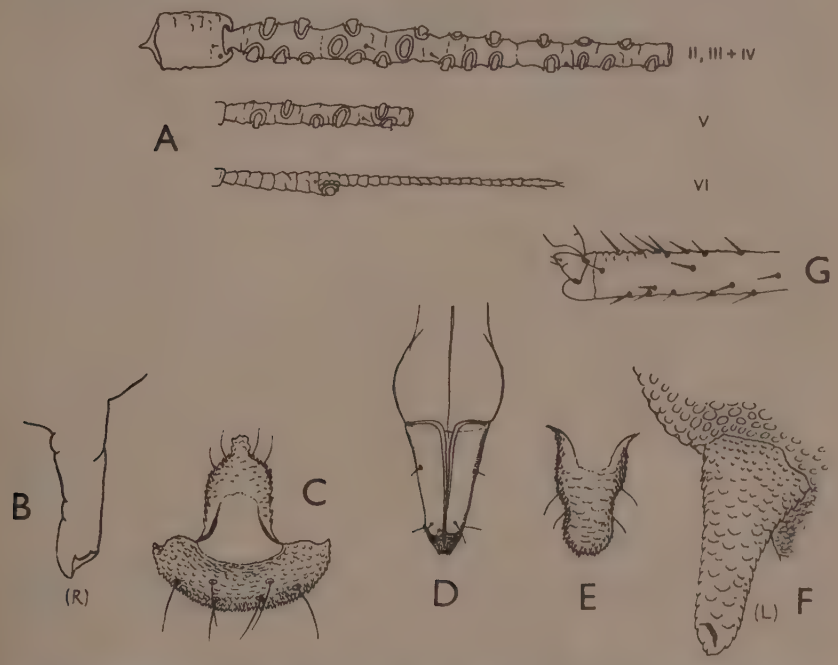

FIG. 2.—*Aspidaphium cuspidati* sp. n. Al. viv. female: A, Antenna, joints II–VI; B, *right* siphunculus; C, cauda (reflexed) and subanal plate. Apt. viv. female: D, Apical joint of rostrum; E, cauda; F, *left* siphunculus; G, apex of hind tibia and first tarsal joint. (*N.B.*—The scales of these enlarged details vary slightly from figure to figure.)

Measurements of specimens:

Body.	Ant. flag.	Flag. joint ratios.	Siph.	Cau.	Ap. jt. rostr.	2nd jt. h. tars.
0·96	0·44	10 : 6 : $4\frac{1}{2}$ + 7	0·13	0·06	0·08	0·09
1·26	0·43	10 : 6 : 5 + 6	0·15	?	0·08	0·08
1·02	0·44	$9\frac{1}{2}$: $5\frac{1}{2}$: 5 + $7\frac{1}{2}$	0·15	0·06	0·08	0·08
1·08	0·44	10 : 6 : 5 + $6\frac{1}{2}$	0·14	0·06	0·08	0·08
1·12	0·44	10 : 6 : 5 + $6\frac{1}{2}$	0·14	0·06	0·09	0·08

(Cambridge, May, 1953, *Acrocladium cuspidatum*; all length measurements in millimetres.)

Alate viviparous female: Small, delicate aphids without the strong cuticular sculpturing seen in the apterae. Frons convex, median ocellus prominent, lateral ocelli rather large. Antennae slender, 5- or 6-jointed, flagellum about three-quarters body length or slightly

more ; joints III to V(IV) with rather few relatively large, very prominent and rather irregularly shaped secondary rhinaria scattered irregularly over their whole length. Antennal hairs as in apterae. Fore wings with media once branched. Abdominal sclerotic pattern consisting of separate segmental sclerites, more or less bar-like, on 1–8 inclusive, marginal sclerites on 2–4 inclusive and very distinct pleural intersegmental " Muskelplatten," those on intersegment 4/5 and to a lesser extent those on intersegment 5/6 extending across the dorsum in transverse rows between the segmental sclerites. Siphunculi small, more cylindrical than those of apterae, with base somewhat oblique to their length and apex with outwardly directed porus as in apterae ; pale, almost smooth, with only slight traces of spinulosity. Cauda relatively shorter than in apterae, of a shape rather characteristic of moss-living aphids, made up of a basal rather parallel-sided part and a small constricted apical appendage (see figure) ; with two pairs of inconspicuous hairs near apex. Femora slightly wrinkled, legs not otherwise sculptured.

Measurements of specimens :

Body.	Ant. flag.	Flag. jt. ratios.	Siph.	Cau.	A.j. r.	Sec. rhinaria on : III.	IV.	V.
0·98	0·73	$14\frac{1}{2} : 10 : 8 : 4\frac{1}{2} + 8\frac{1}{2}$	0·08	0·05	0·07	18/17	8/11	4/5
0·98	0·78	$13 : 9 : 9\frac{1}{2} : 6 + 11$	0·10	?	0·07	18/18	9/8	7/5
1·00	0·78	$13\frac{1}{2} : 10 : 9\frac{1}{2} : 6 + 10$	0·08	?	0·08	17/17	9/7	5/6
1·08	0·77	$(22) : 9\frac{1}{2} : 6 + 10\frac{1}{2}$	0·10	0·06	0·08	24/16	5/7	–/5
1·17	0·82	$15 : 9 : 9\frac{1}{2} : 5\frac{1}{2} + 12$	0·10	0·06	0·07	20/18	8/9	6/6
0·97	0·69	$13\frac{1}{2} : 8 : 8 : 5 + 8\frac{1}{2}$	0·08	?	0·07	23/15	4/7	–/5
1·08	0·83	$14\frac{1}{2} : 10 : 10 : 6\frac{1}{2} + 11$	0·10	?	0·07	20/20	9/13	5/6

(Cambridge, May–July, 1953, *Acrocladium cuspidatum* ; all length measurements in millimetres.)

Larvae (first and second stadia).—Antennae 4-jointed ; femora ventrally, and hind tibiae over nearly whole length, conspicuously spinulose between the hairs. Bead-like cuticular sculpturing confined to head.

Host plant records.—Collected from waterlogged mosses (*Acrocladium cuspidatum* (Hedw.) Lindb. and *Drepanocladus aduncus* (Hedw.) Warnst. growing amongst Phragmites in a choked pond between Cambridge and Coton (O.S. grid ref. 435582, England Sheet 135) in May, 1953, by Dr. M. G. M. Pryor, to whom the writer is indebted for live material. Cultures were maintained throughout the summer in the laboratory, and numerous alatae were produced at intervals from May to August.

Material examined.—13 apterous viviparous females, about 50 alate viviparous females, 4 larvae (first and second stadia). The holotype aptera and morphotype alata will be deposited in the British Museum (Natural History), South Kensington. (Plate II, fig. 1 and 2.)

Taxonomic notes.—Apart from the position of the siphuncular porus only two small characters serve to suggest a separation of this species from *Aspidaphium jeschkei* Börner. One of these is the adornment of the hind tibiae in the apterae ; Börner says of the apterae of *jeschkei* that they, like the larvae, have " bedornten Schienen " ; in *cuspidati* they are at the most slightly rough apically, while those of the larvae are very strongly spinulose. The other point concerns the siphuncular length, which in *jeschkei* is distinctly shorter (" deutlich kürzer ") than the third antennal joint ; in apterae of *cuspidati* the siphunculi are about equal to or only very slightly shorter than ant. III. Pending a comparison of types, which at present seems a rather remote possi-

bility, it is impossible to be more exact about the status of the two species, and it seems justifiable to give a name to the British species.

A very interesting characteristic of this species is that, like *Rhopalosiphum nymphaeae* (L.), the apterae live habitually either awash in a film of free water or actually below the surface of the water out of which the host grows. Their adaptation to this mode of life by means of the hydrofuge tracts of sculptured cuticle is very similar to the method of *R. nymphaeae*, and the type of cuticular papilla which composes the hydrofuge tracts is very like the small bead-like spinules of which the cuticular pattern of *nymphaeae* is made up. The other species of the genus, *A. escherichi* Börner, has the dorsal cuticle almost smooth, and it seems likely that this will prove to be correlated with life in a drier habitat than that of *cuspidati*.

Since writing the above I have received the following information from Dr. Hille Ris Lambers, who has at his disposal material of *Aspidaphium jeschkei* Börner and *A. escherichi* Börner determined by Börner himself: "The differences between your species and *escherichi* are manifold. In your species the siphunculi are densely spinulosely imbricated and 2·1 times as long as the diameter in the middle. In Börner's they are 3½–4 times as long as wide in the middle, and dispersely covered with large, flat, blunt scales. The papillae on the side of the body in your species are up to twice as large as in Börner's, with flat or convex tops and basal constriction. In Börner's species they are blunt to rounded conical. In your species the hind tibiae only are dorsally apically spinulose, but in Börner's species all the tibiae are spinulose ventrally from the base to just before the apex and dorsally and laterally on apical 1/3 to 1/4. The processus terminalis in your species is longer than the base of Vth segment, but in Börner's it is just shorter than the base."

Dr. Hille Ris Lambers adds that Börner's material of *jeschkei* may be composite, the putative original material (though not labelled with a name by Börner) being a much damaged *Metopolophium*-like species, and a second sample containing aphids indistinguishable from *escherichi*. In any event, neither sample is identical with the species described here.

30. *Pseudacaudella rubida* (Börner, 1939).

The original description (Börner, 1939) of this species was drawn up from 4th instar immature specimens only; and it was assigned to the genus *Acaudella* Nevsky. In 1950 Börner removed it to a new genus *Pseudacaudella*, distinguished from *Acaudella* by the finger-shaped cauda, longer processus terminalis (about twice base of VI), absence of secondary rhinaria in apterae and distinct wart-shaped triommatidion of the compound eyes. The dorsal cuticle is described as leathery-wrinkled. From the earlier description the colour in life is red; the hairs are sparse and short; and the siphunculi are smooth-sided and straight. The original specimens were sieved (from moss or litter ?) in the Riesengebirge district.

The only British record known to the writer is of a single alata caught in a trap in North-west Derbyshire in September, 1945, by Dr. L. Broadbent (Broadbent, 1946), and identified by Dr. D. Hille Ris Lambers.

Measurements of single specimen:

Al. viv. female: Body 1·22 mm., ant. flagellum about 0·80 mm., flag. jt. ratios 37 : 24 : 20 : 10 + ?, siphunculus 0·18 mm., cauda 0·06 mm., caudal hairs 4, apical joint of rostrum

0·09 mm., secondary rhinaria on ant. III(R) 13, on IV(R) 7, on V(R) 1. (Trapped, Derbyshire, 13.ix.45.)

31. *Schizomyzus lindneri* Börner, 1950.

The original description of this genus and species (Börner, 1950) is brief enough to quote in its entirety.

"Alatae with once-branched Media; antennae with 6 joints, III–V with a few secondary rhinaria. Siphunculi cylindrical or weakly clavate, scabrous on basal half, porus flanged. Frons flat. Hind tarsus without peg sensilla. Dorsum of apterae sclerotised. Cauda like that of *Myzodium rabeleri* Börner, but more slender. Mesothoracal furca sessile. Pleural hairs as in *Ovatus* Van der Goot. 0·8–1·2 mm. From sievings, probably a moss liver."

The original record was from Silesia.

A single small larva collected from *Hylocomium squarrosum* at St. Asaph, Flint, by Mr. F. H. Jacob, has been determined as *S. lindneri* by Dr. Hille Ris Lambers. I am indebted to him for the information that the immature apterae of this genus are peculiar in having a strongly sclerotic dorsum, which is a diagnostic character. Jeschke's original material (Börner, 1952) consisted of one aptera found in a nest of *Lasius niger* and two alatae swept in a neighbouring meadow in the Riesengebirge. Whether some degree of myrmecophily can be inferred from this record appears doubtful.

32. *Brachysiphum thalictri* (Koch, 1854).

Börner (1952) regards this species as belonging to the genus *Cerosipha* Del Guercio as interpreted by him. It seems to the writer sufficiently different from the genus *Aphis* L. sensu latiori (of which *Cerosipha* forms a part) to justify retaining Van der Goot's genus *Brachysiphum*, which was erected (Van der Goot, 1913) with *thalictri* as type.

British records of *thalictri* are hitherto unaccountably few, due probably to the fact that the host, *Thalictrum aquilegifolium*, is not a native British plant. According to Börner (1952) *Thalictrum minus*, though given as a host for the species by Koch, is not used by *thalictri*.

The records available to me at present are (1) a large colony of apterae taken from *Thalictrum* at Harpenden, Herts., 20.v.42, by Mr. C. T. Gimingham; (2) two alatae from *Thalictrum*, Wigginton, Yorks., 17.vi.50 (*Dr. J. H. Fidler*); and (3) one alata trapped near Stonehaven, Kincardineshire, 2.vii.51, by Mr. M. W. Shaw. I am indebted to them for the opportunity to draw up the following notes from their material and records.

The apterae in life are bluish-grey and very mealy, and cluster thickly up the flowering stem and buds (*C. T. Gimingham, MS. notes*). Morphologically the characters of the species are very similar to those of *Aphis* L., but the apterae are readily distinguishable by their large size, elongate oval shape and peculiar siphunculi and cauda. The former are minute, not longer than broad and only about one-third as wide as the base of the cauda, subcylindrical, flangeless and with only four or five lines of imbrication. The cauda is rather broad, acuminate tongue-shaped, with up to about 12 hairs more or less in pairs on the apical third. The tip is acute instead of blunt as in *Aphis* L. The abdominal dorsum is without sclerotic pattern apart from narrow bars across the seventh and eighth tergites and the intersegmental muscle sclerites. Small conical or nipple-shaped marginal tubercles occur on the pronotum and seventh abdominal segment, and somewhat flatter ones on the first

abdominal segment. Apical rostral joint short and blunt, only a little more than half as long as second joint of hind tarsus. Rostrum as a whole not reaching beyond second coxae.

Alatae have a more extensive abdominal pigmented pattern, consisting of fairly large marginal sclerites on abd. 2–4 inclusive and sclerotic bars, mostly rather broken up, on abd. 2–8 inclusive. The third antennal joint bears 5–11 round secondary rhinaria from a little before one-quarter to about five-sixths of its length. Wing venation normal, second fork of media in fore wing at about three-quarters the distance from the first fork to the termen.

Measurements of single specimens :

Apt. viv. female : Body 2·45 mm., antennal flagellum 1·33 mm., flag. jt. ratios 26 : 17 : 15 : 9 + 16, siphunculus 0·05 mm., cauda 0·16 mm., caudal hairs 11, apical joint of rostrum 0·10 mm., 2nd jt. hind tarsus 0·18 mm., longest measurable hair on ant. III 22μ. (*Thalictrum*, Harpenden, Herts., 20.v.42).

Al. viv. female : Body 1·68 mm., ant. flagellum 1·31 mm., flag. joint ratios 24 : 17½ : 15 : 9 + 16½, siph. 0·04 mm., cauda 0·13 mm., caudal hairs 10, apical joint of rostrum 0·10 mm., 2nd jt. hind tarsus 0·18 mm., longest measurable hair on ant. III 16μ, secondary rhinaria on ant. III 10 and 11, chaetotaxy of first tarsal joints 3, 3, 3. (Trapped, Stonehaven, 2.vii.51.)

33. *Aphis acetosae* Fabricius, 1775.

Plump, dark green or olive-brown to greenish-black, with tapering, rather slender blackish siphunculi and a rather slender black cauda with a somewhat broadened basal half. All hairs other than ventral body hairs and inner tibial hairs very minute, only about one-quarter the articular diameter of ant. III. Abdominal dorsum with separate blackish segmental bars, basally often broken medially, on all tergites. Prominent nipple-shaped marginal tubercles on pronotum and abd. 1–4 and 7. Apical half of ant. V, whole of ant. VI, all femora except extreme bases, and apices of all tibiae, darkened. Rostrum about to third coxae, apical joint normal, slightly longer than second joint of hind tarsi. Living under basal shelters on *Rumex acetosella* in sandy places, attended by ants. Alatae not yet seen from Britain.

A. acetosae appears to be locally common in sandy areas in Surrey, and is probably widespread throughout the country in suitable terrain.

Börner gives the hosts as *Rumex acetosa*, seldom *R. hydrolapathum*, and quotes Buckton (1877) as having described the species also as *acetosae*. It appears unlikely that Buckton's record refers to the present species, since he says of his *acetosae* " legs hairy ", and in fact figures the aptera with long tibial hairs. Hille Ris Lambers, in letters to the writer, at first regarded what is here called *acetosae* as a distinct species, but later concluded that only one form was involved. Since the writer has as yet not seen material from the typical host there would seem to be some doubt as to whether a new name should be given to the aphids from *R. acetosella*. It is in any case apparently new to the British fauna.

Measurements of one aptera :

Body 1·98 mm., ant. flagellum 0·91 mm., flag. jt. ratios 15 : 9 : 9 : 7 + 17, siphunculus 0·27 mm., cauda 0·20 mm., caudal hairs 11, apical joint of rostrum 0·13 mm., 2nd jt. hind tarsus 0·11 mm. (*Rumex acetosella*, West Byfleet, Surrey, 18.viii.49.)

34. *Aphis ballotae* Passerini, 1860.

One of the small dark green species of the *frangulae-beccabungae* complex, of which a number live holocyclically on Labiatae (Börner, 1952). Records

by Buckton (1877) and, following him, Theobald (1927) and Fidler (1949) of *Aphis scabiosae* Schrank from *Ballota nigra* should be this aphid. According to Börner only slight leaf distortion is caused on *Ballota*.

35. *Aphis brohmeri* Börner, 1952.

A long-haired species with large marginal tubercles on abd. 1–4 (5) and 7, nymphs without wax spots on dorsum and alatae with 9–15 secondary rhinaria on III, 0–1 on V (Börner, 1952). Dark chocolate to purplish brown in colour, living in smallish colonies on the lower parts of the stems of *Anthriscus sylvestris*. British specimens taken in May have rather more pronounced dorsal banding in both apterae and alatae than indicated by Börner in his description (he described the dorsal bands in apterae as sparse or absent, in alatae as small), and British alatae have up to 17 rhinaria on III and up to 3 on IV. The marginal tubercles are of moderate size on the anterior abdominal segments. Siphunculi fairly slender, tapering. Cauda thick, short and blunt. Antennae with apex of joint IV and all V and VI dusky in apterae. A number of apterae are incipient alatiforms, with one or more abortive rhinaria on ant. III. Antennal and marginal body hairs very long, fine and acute, those on ant. III up to about 54μ, or nearly twice the articular diameter of the joint.

Colonies of *brohmeri* (identified at the time as *podagrariae* Schrank) were found by the writer on *Anthriscus sylvestris* at Chrishall, on the Cambs.-Essex border, on 12.v.49. The following measurements of single specimens are taken from this material.

Apt. viv. female : Body 2·61 mm., ant. flagellum 1·36 mm., flag. joint ratios 23 : 16 : 14½ : 8½ + 22, siphunculus 0·30 mm., cauda 0·21 mm. × 0·21 mm. (basal width), caudal hairs 25, apical joint of rostrum 0·15 mm., 2nd jt. hind tarsus 0·14 mm., longest measurable hair on ant. III 54μ, marginal body hair (abd. 2) 57μ.

Al. viv. female : Body 2·32 mm., ant. flagellum 1·33 mm., flag. joint ratios 20½ : 17 : 15 : 9 + 21½, siph. 0·28 mm., cauda 0·18 mm. × 0·14 mm. (basal width), caudal hairs 29, apical joint of rostrum 0·16 mm., 2nd jt. hind tarsus 0·14 mm., secondary rhinaria on ant. III 15 and 17, on IV 1 and 3.

36. *Aphis brunellae* Schouteden, 1906.

A very small pale yellowish to whitish species, with a dorsal patch of darker green in some early summer apterae, living under the leaves and up the stems and inflorescences of *Brunella vulgaris* (*Prunella vulgaris* of English botanists). Apparently a rare species, though probably overlooked on account of its small size and cryptic habits.

Macerated apterae almost wholly pale, except for the siphunculi which are often rather darkened in spring forms, and the apices of antennae and tibiae which are slightly dusky. Antennae of 5 or 6 joints, later generations usually with only 5, processus terminalis 2·3 to 3·2 times basal part of VI (V). All antennal and dorsal body hairs very small, acute, not more than 7μ long, or on ant. III less than half articular diameter of joint. Tibial hairs up to about 20μ, or about two-thirds minimum diameter of tibia. Marginal tubercles on pronotum and abd. 1 and 7 only, rounded and moderately conspicuous. Siphunculi from a little shorter to considerably longer than cauda, subcylindrical, imbricate, with very slight apical flange. Cauda normal, blunt finger-shaped, with 4 to 6 hairs. Rostrum about to third coxae, apical joint from 1·2 to 1·7 times second joint of hind tarsi.

Male apterous, very small, straw yellow with black head, dark antennae and pigmented bars across pro- and mesonotum and abd. 6–8 inclusive. Antenna (in one specimen) 5-jointed, genitalia well developed.

Oviparous female similar in general to apterous vivipara, with normally 5-jointed antennae and pale legs and siphunculi, the latter sometimes slightly smoky apically; hind tibiae rather markedly swollen, with numerous pale sensoria over the whole of the basal five-sixths; outer apical hairs up to about 36μ in length.

British material in the writer's possession includes apterae from Great Wilbraham, Cambs., 26/28.vii.49, and apterae, one male and oviparae from Waddesdon, Bucks., 6.x.52, the latter through the kindness of Mr. V. F. Eastop, who collected them.

Measurements of single specimens:

Apt. viv. female: Body 1·10 mm., ant. flagellum 0·61 mm., joint ratios (flagellum) 12 : 6 : 5 + 15, siphunculus 0·14 mm., cauda 0·11 mm., caudal hairs 4, apical joint of rostrum 0·10 mm., 2nd jt. hind tarsus 0·06 mm. (*Brunella*, Great Wilbraham, Cambs., 26/28. vii.49.)

Apt. male: Body 0·85 mm., ant. flagellum 0·75 mm., joint ratios (flagellum) 20 : 7 : 6 + 14, siphunculus 0·08 mm., cauda 0·09 mm., caudal hairs 4, apical joint of rostrum 0·08 mm., secondary rhinaria on ant. III 23, on IV 4 (one antenna missing).

Ovip. female: Body 1·28 mm., ant. flagellum 0·54 mm., joint ratios (flagellum) 11 : 6 : 5 + 12, siphunculus 0·09 mm., cauda 0·11 mm., caudal hairs 4, apical joint of rostrum 0·09 mm., 2nd jt. hind tarsus 0·07 mm., sensoria on hind tibiae (approximate count) 78 and 75.

(Both sexes from *Brunella*, Waddesdon, Bucks., 6.x.52.)

37. *Aphis chloris* Koch, 1854.

First referred to as a British species by Wilson (1938), in a paper devoted to non-systematic aspects of the biology of the species; the original discovery of the species appears to be credited to Garthside in 1929. These records were evidently overlooked by Kloet and Hincks (1945). *A. chloris* was found commonly by the writer in September, 1950, and July, 1951, at West Byfleet, Surrey, and all forms except fundatrices were collected from basal parts of *Hypericum perforatum*. The following notes are from this material and apterae taken at Stockholm, Sweden, in August, 1948.

Rather bright apple-green in life; apterous males rather darker, with blackish antennae; alatae green with black head and thorax. All forms with blackish siphunculi and paler cauda; legs palish sclerotic with apices of tibiae dusky.

Alatae and males with antennae 6-jointed, apterae and oviparae with 5- or 6-jointed antennae (apterae usually with 6, oviparae often with 5). Marginal tubercles on pronotum and abd. 1 and 7 only. Oviparae with hind tibiae variable; some hardly at all thickened, with only about 4–8 sensoria on the second quarter of the tibial length, others rather markedly swollen, with up to about 40 sensoria distributed from just before one-quarter to beyond three-fifths of the length. Alatae with 5–8 circular secondary rhinaria in a single row along ant. III (two specimens). Male with rather imperfectly formed small rhinaria along joints III–V, and sometimes 1–2 also on the basal part of VI; the numbers as follows: III 17–23, IV 8–16, V 2–10 (six specimens). Joint IV of the antennae is short in all forms, frequently in the apterae and oviparae considerably shorter than V. Antennal hairs very small, up to 8μ long, acute; dorsal body hairs up to about 11μ, ventral body hairs longer (up to about 24μ) but very few in number, in single transverse rows of about 6–8 per abdominal sternite. Tibial hairs to about two-thirds mean tibial diameter, basally rather shorter.

The bright green colour of this species becomes rather less constant in the autumn generations, adult apterae and oviparae being variably dark mottled green to yellowish-green; immature forms remain apple-green.

Measurements of single specimens :

Apt. viv. female : Body 1·50 mm., ant. flagellum 0·74 mm., joint ratios (flagellum) 12 : 7 : 9 : 7 + 11, siphunculus 0·19 mm., cauda 0·15 mm., caudal hairs 4, apical joint of rostrum 0·10 mm., 2nd jt. hind tarsus 0·11 mm. (*Hypericum*, West Byfleet, Surrey, 29.vii.51.)

Al. viv. female : Body 1·49 mm., ant. flagellum 0·86 mm., joint ratios (flagellum) 15 : 8 : 10 : 8 + 13, siphunculus 0·16 mm., cauda 0·12 mm., caudal hairs 4, apical joint of rostrum 0·10 mm., 2nd jt. hind tarsus 0·11 mm., secondary rhin. on III 7 and 8. (Data as for aptera.)

Apt. male : Body 1·07 mm., ant. flagellum 0·88 mm., joint ratios (flagellum) 15 : 10½ : 11 : 7 + 11½, siphunculus 0·10 mm., cauda 0·10 mm., caudal hairs 5, apical joint of rostrum 0·08 mm., 2nd jt. hind tarsus 0·09 mm., sec. rhin. on III 23 and 19, on IV 13 and 16, on V 5 and 8, on base of VI 0 and 1. (*Hypericum*, West Byfleet, 16.ix.50.)

Apt. ovip. female : Body 1·18 mm., ant. flagellum 0·58 mm., joint ratios (flagellum) 8 : 6 : 7 : 6 + 9, siphunculus 0·10 mm., cauda 0·13 mm., caudal hairs 6, apical joint of rostrum 0·08 mm., 2nd jt. hind tarsus 0·08 mm., sensoria on hind tibiae 16 and 4. (*Hypericum*, data as for male.)

38. *Aphis commensalis* Stroyan, 1952.

For the description and particulars of the biology of this species see Stroyan (1952).

39. *Aphis crepidis* (Börner, 1940).

Originally described (Börner, 1940) as *Cerosipha crepidis* ; later (Börner, 1952) placed in *Toxopterina* Börner, subgenus *Tuberculaphis* Börner, next to *Aphis taraxacicola* (Börner), which it much resembles. A small dark green species living under the basal rosette of *Crepis biennis* and *C. capillaris*, in an earth shelter erected by attendant ants. The writer's material is too scanty to indicate any reliable morphological difference between *crepidis* and *taraxacicola* ; the former is generally smaller in size than the latter, and the antennae in apterae are normally 5-jointed.

British records of *A. crepidis* to date are : (1) *Crepis capillaris*, Great Wilbraham, Cambs., 27.vii.49 (*H. L. G. Stroyan*) ; (2) *Hypochoeris radicata*, Reading, Berks., date not given (*V. F. Eastop, vide* Eastop, 1951). This latter record, the material of which has not been seen by the writer, appears probably to be an error of identification, either of the host or the aphid ; the former seems more probable, since it would be easier to confound the basal rosettes of *Hypochoeris radicata* and *Crepis biennis* than the yellow *Aphis hypochoeridis* (Börner) with the dark green *A. crepidis*.

Measurements of one specimen :

Apt. viv. female : Body 1·14 mm., ant. flagellum 0·55 mm., flag. joint ratios 12½ : 5½ : 5 + 11½, siphunculus 0·14 mm., cauda 0·11 mm., caudal hairs 6, ap. jt. rostrum 0·10 mm. 2nd jt. hind tarsus 0·08 mm. (*Crepis capillaris*, Gt. Wilbraham, Cambs., 27.vii.49.)

40. *Aphis etiolata* Stroyan, 1952.

For the full description and an account of the biology of this species see Stroyan (1952).

As an extension of the known British range of *etiolata* may be quoted apterae collected from roots of *Rumex acetosella* at Barton Mills, Suffolk, on 9.vi.52 (*H. L. G. Stroyan*).

Since the publication of the original description material of *Aphis sambuci* L. has been received from the late Mr. H. Britten which amply confirms the close relationship postulated for *A. etiolata* and *A. sambuci*. The aphids sent by Mr. Britten were collected from *Rumex acetosella*, and the apterae resemble those of *etiolata* in almost all respects. However, the antennal hairs of the *sambuci* are up to more than half the articular diameter of the joint on ant. III (against less than one-third in *etiolata*) and fine and acute ; while a single male present in the sample is alate and typical of *sambuci*, with very numerous rhinaria all along the very stout, stumpy third to fifth joints of the antennae.

41. *Aphis klimeschi* (Börner, 1950).

The original description of this species (Börner, 1950) as *Doralida klimeschi* is as follows :

"Rostrum longer than in *medicaginis* and *coronillae* (0·53–0·55 mm.), 1·8–2·2 times siphunculi. 8–10 partially blunt or split caudal hairs. Marginal tubercles as in *medicaginis*, viz. present on abd. 1–4(5) and 7. Dorsum in apterae with broad transverse bars, which may be fused together at the sides of the body or even on the mid-dorsum on segments 6–4 or even further cephalad. Alatae unknown. 1·6–1·7 mm. On *Anthyllis vulneraria*, Glockner district, Klimesch leg."

A small sample of an *Aphis* answering rather well to the above description was collected from *Anthyllis vulneraria* on the Gogmagog Hills, Cambridgeshire, on 27.v.52 (*H. L. G. S.*). The aphids lived basally attended by *Lasius niger*. In life they were pale grey-green in colour. Four alatae were reared from the material collected, and a description of this form follows. The only character not observable in the Cambridge specimens is the partially blunt or split form of the caudal hairs ; this might well be an idiosyncrasy of the type series, and is not considered a significant difference in view of the small amount of material hitherto collected. The sample here recorded was listed in a recent paper on Cambridgeshire Aphididae (Stroyan, 1953*b*) as *Aphis loti* Kltb., which is also recorded from *Anthyllis*.

Alatae measure 1·28–1·52 mm., with antennae from 0·59 to 0·70 of body length. Processus terminalis 2·7–2·8 times base of ant. VI, or 0·77–0·97 times ant. III in length. Secondary rhinaria rather large, those on III arranged more or less in a single row ; numbers on joints III–V inclusive being 6–12, 1–2, 0–1 respectively. Abdominal sclerotic pattern consisting of rather large marginal sclerites on 2–5 inclusive, that on 5 sometimes united to the rather large post-siphuncular sclerite ; narrow bars right across tergites 7 and 8 ; a very small median sclerite usually present on 6 ; and well marked dark intersegmental muscle sclerites. Marginal tubercles large and mammillar in form ; in three out of four alatae present on one or both sides on abd. 6 in addition to the distribution given by Börner for apterae. Cauda elongate blunt triangular, with 8–9 rather strongly curved hairs. Antennal, cephalic and body hairs dorsally very small and inconspicuous, acute, those on ant. III up to about 9μ in length, or about half articular diameter of joint.

Measurements of specimens :

Apt. viv. female : Body 1·36 mm., ant. flagellum 0·74 mm., flag. joint ratios 12 : 7½ : 8 : 5 + 13½, siphunculus 0·21 mm., cauda 0·11 mm., caudal hairs 8, apical joint of rostrum 0·13 mm., 2nd jt. hind tarsus 0·10 mm. (*Anthyllis vulneraria*, Gogmagog Hills, Cambs., 27.v.52.)

Al. viv. females :

Body . .	1·28, 1·41, 1·28, 1·52 mm.
Ant. flagellum .	0·89, 0·89, 0·82, 0·90 mm.
Flag. jt. ratios .	16½ : 10½ : 9½ : 5 + 14, 16 : 9 : 9½ : 5½ + 15½, 14½ : 9 : 9 : 5 + 14, 17½ : 10 : 10 : 5 + 13½.
Siphunculus . .	0·19, 0·18, 0·16, 0·18 mm.
Cauda . . .	0·11, 0·11, 0·11, 0·11 mm.
Caudal hairs . .	9, 8, 8, 8.
Ap. jt. rostrum .	0·13, 0·12, 0·13, 0·13 mm.
2nd jt. hind tarsus .	0·10, 0·10, 0·10, 0·10 mm.
Rhinaria III . .	8/12, 9/9, 6/7, 8/10.
IV . .	2/2, 2/2, 2/1, 1/2.
V . .	0/0, 1/0, 0/0, 0/1.

(Data as for apt. viv. female.)

42. *Aphis lambersi* (Börner, 1940).

Originally described (Börner, 1940) as *Doralina lambersi* ; later (Börner, 1952) placed in *Toxopterina* Börner, subgenus *Tuberculaphis* Börner (*vide* also *Aphis crepidis* (Börner) and *A. taraxacicola* (Börner)). The original description runs :

" Distinguished from *D. assueta* Wlk. (H.R.L.) by large marginal tubercles on prothorax and abd. 1–5 and 7. Appendages very short-haired. Apterae often with paired segmental tergal sclerites. 1½–1¾ mm. Basal collar and lower leaf-sheaths of *Daucus carota*."

The reference to *assueta* (Walker) is to the species so named by Hille Ris Lambers (1931). This is in fact (Dr. Hille Ris Lambers, *in litt.*) apparently a form of *Aphis fabae* Scopoli, or at any rate of the *fabae*-complex.

Aphis lambersi is not apparently new to Britain. Theobald (1927) records the closely related *A. plantaginis* Schrank from carrot, and this was presumably *lambersi* ; but as he did not list his locality records separately for different hosts it is not possible to authenticate the records geographically. Recent records of the species are : (1) West Byfleet, Surrey, April–October, 1948, abundant ; (2) Woodchurch, Isle of Thanet, E. Kent, 13.vii.50 ; (3) Fulbourn, Cambs., 5.vii.50 ; all from *Daucus carota* (*H. L. G. S.*). Probably the distribution of *A. lambersi* will be found to be co-extensive with that of *Daucus carota*. It has also occurred on cultivated carrot (*F. H. Jacob*) ; but owing to its monoecy on *Daucus* it is unlikely that it could ever become a pest where a normal rotation is practised.

The colour of living material varies very much through the season. Fundatrices and fundatrigeniae are very dark blackish-green to black ; later summer generations become paler, ranging from dull olive-green to dark blue-green ; gynoparae and oviparae are deep purplish-brown ; and the small apterous males have the body reddish-brown.

Apterae of *lambersi* may be distinguished from the closely related *Aphis plantaginis* Schrank, *A. taraxacicola* (Börner) and *A. crepidis* (Börner) by the more extensive pigmentation of the posterior abdominal segments. The transverse bar across the seventh abdominal tergite extends nearly the whole distance between the marginal tubercles, while in the other

species no specimen has been seen in which this bar is more than one-third of the intertubercular distance in length. Midsummer apterae of *lambersi* also retain the dark pigmentation of the head, mesonotum, siphunculi and femoral and tibial apices characteristic of the earlier generations, while the other species from midsummer onwards usually become smaller and less heavily pigmented. The antennae of *lambersi* are also persistently 6-jointed, while 5-jointed antennae are frequent among the late summer forms of the other species. Abdominal segment 6 in *lambersi* bears a small median sclerite or pair of scleroites, and also a pair of small postsiphuncular sclerites.

Other characters are for the most part more variable and of less value for diagnosis. Alatae may be distinguished from those of *plantaginis* and *taraxacicola*, though less reliably than the apterae, by the length of the sclerotic bar on the seventh tergite, which is again almost complete between the marginal tubercles in *lambersi*, rarely more than half the intertubercular distance in the others; they may be more effectively separated by their shorter siphunculi (0·10–0·11 × body length, against 0·14–0·17 × body length in *taraxacicola* and *plantaginis*) and by the higher range of rhinarial numbers on ant. III–V (*lambersi* 11–17, 0–7, 0–2; *taraxacicola* 6–11, 0–4, 0; *plantaginis* 6–8, 0, 0 in material studied).

All antennal, cephalic and dorsal body hairs are very short and inconspicuous, those on ant. III in apterae up to 10μ in length, or about half articular diameter of joint. Caudal hairs 11–16 in number. Ovipara with hind tibiae not markedly swollen, but somewhat thickened over basal two-thirds, with a rather small number of sensoria scattered over the thickened part.

Measurements of single specimens:

Fundatrix: Body 2·16 mm., ant. flagellum 0·85 mm., flag. jt. ratios 25 : 10 : 7 + 11, siphunculus 0·21 mm., cauda 0·18 mm., caudal hairs 12, apical joint of rostrum 0·14 mm., 2nd jt. hind tarsus 0·10 mm. (West Byfleet, April 1948.)

Apt. viv. female: Body 1·86 mm., ant. flagellum 1·04 mm., flag. jt. ratios 18 : 11 : 10 : 7 + 19, siphunculi 0·22 mm., cauda 0·14 mm., caudal hairs 15, apical jt. rostrum 0·13 mm., 2nd jt. hind tarsus 0·11 mm. (West Byfleet, 7.x.48.)

Al. viv. female: Body 1·78 mm., ant. flagellum 0·98 mm., flag. jt. ratios 17 : 9 : 11 : 6½ + 18, siphunculus 0·19 mm., cauda 0·18 mm., caudal hairs 12, 2nd jt. hind tarsus 0·11 mm., secondary rhinaria on ant. III 12 and 13, on IV 1 and 1, on V 0 and 1. (West Byfleet, ex culture, 24.iv.48.)

Apt. male: Body 1·22 mm., ant. flagellum 0·91 mm., flag. jt. ratios 15 : 9½ : 9½ : 6½ + 17, siphunculus 0·12 mm., cauda 0·10 mm., caudal hairs 12, apical jt. rostrum 0·12 mm., 2nd jt. hind tarsus 0·09 mm., secondary rhinaria on ant. III 28 and 27, on IV 9 and 8, on V 4 and 4. (West Byfleet, 3.x.48.)

Ovip. female: Body 1·78 mm., ant. flagellum 0·87 mm., flag. jt. ratios 14 : 8 : 9½ : 6 + 17, siphunculus 0·18 mm., cauda 0·14 mm., caudal hairs 16, apical joint of rostrum 0·11 mm., 2nd. jt. hind tarsus 0·10 mm., sensoria on hind tibiae 13 and 8. (West Byfleet, 7.x.48.)

43. *Aphis lamiorum* (Börner, 1950).

Described as *Doralina lamiorum* (Börner, 1950); later (1952) removed by the author to *Cerosipha* Del Guercio. His description runs:

"Agreeing closely with *D. nepetae* Kalt. (*sic*), *origani* Pass. and *clinopodii* Pass. Male apterous, ovipara with slender hind tibiae. Body size and rostral length as in *D. ballotae* Pass., which differs in having alate males and oviparae with incrassate hind tibiae. In mixed stands of the host-plants (*Lamium* and *Ballota?*) only on *Lamium* spp.; cross-transference experiments negative, loose leaf-nest formation on *Lamium*."

The very closely related group of *Aphis* (*Cerosipha*) species on Labiatae is further complicated by the fact that the rather polyphagous and heteroecious *A. beccabungae* (Koch) is also recorded from *Lamium* and *Galeopsis* as secondary

hosts (Börner, 1952). Dark green *Aphis* apterae taken at Little Chishill, Essex, on 11.v.49, causing loose leaf-curl on the apices of *Lamium album*, are ascribed by the writer to *lamiorum*, as the date does not permit of such large colonies being the progeny of spring migrants. A record by Eastop (1951) of *lamiorum* from *Lamium* at Reading, Berks., must be viewed with reserve in the absence of any further particulars of the date, numbers collected, deformation of the host-plant, etc.

Measurements of one specimen :

Apt. viv. female : Body 2·02 mm., ant. flagellum 1·21 mm., flag. jt. ratios $23\frac{1}{2} : 15 : 12\frac{1}{2} : 6 + 18\frac{1}{2}$, siphunculus 0·37 mm., cauda 0·19 mm., caudal hairs 8, apical joint of rostrum 0·14 mm., 2nd jt. hind tarsus 0·11 mm., longest measurable hair on ant. III 15μ, articular diameter of III 22μ. (*Lamium album*, Little Chishill, Essex, 11.v.49.)

44. *Aphis mammulata* Gimingham and Lambers, 1949.

For the full description of this species see Gimingham and Hille Ris Lambers (1949). Börner (1952) places the species in his genus *Medoralis*, and gives as a synonym *Doralina versicolor* Börner, 1950, an identity also suggested by the writer (Stroyan, 1952). Dr. Hille Ris Lambers considers this incorrect in view of the peculiar chaetotaxy of the abdominal margins in *mammulata*, which does not appear in the material of *versicolor* seen by him.

The writer found the species very abundant in the area from which the type series originated (near Eastleach Martin, Oxon./Gloucs. border) on 3.x.53. The aphids were collected along a row of well-grown *Rhamnus* bushes by the roadside, and were made obvious by the assiduous attentions of *Lasius fuliginosus*—an association not before seen by the writer with any species of *Aphis*. The red-brown " young forms " referred to in the original description turned out, as suspected, to be the small apterous males.

45. *Aphis podagrariae* Schrank, 1801.

A member of the " Black *Aphis* " group, living monoeciously on *Aegopodium podagraria*, usually in tightly curled leaves, occasionally in the umbels or on the stems and leaf petioles (Börner, 1952). Confusion with *A. fabae*, which also infests *Aegopodium*, very probable during the summer months. Pending the satisfactory working out of the morphological taxonomy of this group no detailed description can profitably be given here. Price Jones at a conference of Advisory Entomologists held in London in December, 1947, reported the finding of a strongly leaf-curled patch of *Aegopodium* in Sussex in 1947, from which apterae of a black *Aphis* were collected, the inference being that this was *podagrariae* Schrank. No further details were given, and this is all the information available to the writer about *podagrariae* in Britain, unless a small sample of two apterae and one alata collected from *Aegopodium* at Cambridge on 6.vii.50 is also this species. The alata of this latter sample has rather short antennal joints when compared with average midsummer material of *A. fabae*, with secondary rhinaria on III and IV numbering 13 and 3 respectively on both sides.

A. podagrariae is widely distributed and generally common in Europe, and more information on its presence in Britain is desirable.

46. *Aphis poterii* (Börner, 1940).

A very small dark blackish-green species, living monoeciously on *Sanguisorba minor*, in basal shelters attended by ants. Midsummer apterae 1·0–1·7 mm. long, body plump oval, cuticle often with well-marked reticulation. Antennae, legs and cauda pale, except for slight dusky shading on ant. VI and apices of tibiae. Siphunculi blackish, in smaller specimens only slightly dusky, from about 0·95 to 1·22 times as long as cauda, which is blunt finger-shaped, without a constriction, and with 5–8 hairs. Antennae in smaller examples usually 5-jointed. Rostrum to between mid- and hind-coxae. Marginal tubercles usually on pronotum and abd. 1 and 7 only, sometimes small ones also on abd. 2 or 2–3. Marginal abdominal hairs about equal to greatest diameter of spiracular pori. Hairs on third antennal joint up to about 10μ, or less than two-thirds articular diameter of joint.

A. poterii is closely related to *A. tormentillae* Passerini, from which the apterae may be distinguished by the much shorter cauda and generally much lighter pigmentation. There is also a biological distinction in the myrmecophily of *poterii*, since *tormentillae* is entirely non-myrmecophilous and lives scattered on the flowers and leaf-axils of its host-plant, *Potentilla erecta*.

The only British record to date is of colonies of apterae found at the bases of plants of *Sanguisorba minor* growing on the chalk rampart of Fleam Dyke, Cambridgeshire, on 26.vii.49, by Dr. Hille Ris Lambers and the writer. The following biometric data are from a specimen of this collection.

Apt. viv. female : Body 1·55 mm., ant. flagellum 0·70 mm., flag. jt. ratios 18 : 7 : 5 + 14, siphunculus 0·15 mm., cauda 0·13 mm., caudal hairs 7, apical joint of rostrum 0·11 mm., 2nd jt. hind tarsus 0·09 mm.

47. *Aphis ruborum* (Börner, 1931).

Börner (1931) originally placed this species in *Doralis* Leach. In 1952 it is placed in *Medoralis* Börner, subgenus *Aphidula* Nevsky (*Leucosiphon* Börner); and is made a synonym of *Aphis mordwilkiana* Dobrovljansky, 1913. Börner's name is retained here for the present, since Dobrovljansky's description has not hitherto been accessible, and similar synonymies have in the past not always proved reliable. *Aphis ruborum* lives monoeciously on various species of bramble. The spring forms are blue-green with pale straw-coloured siphunculi, and live in dense colonies on the young shoots of their hosts. Later in the summer the aphids disperse and live scattered under the leaves, in the flowers and on the developing fruits. These dispersed forms are very small and pale in colour, bearing hardly any resemblance to the spring generations. In this they resemble the summer generations of the related *Aphis idaei* Van der Goot on raspberry.

Both alatae and apterae may be distinguished from those of *idaei* by the normal *Aphis* proportions of the cauda and siphunculi; in *idaei* the cauda is short, thick and very blunt, the siphunculi very long and thin, not at all like those of any other British *Aphis* species. The apterae of *ruborum* also have the siphunculi pale, or only darkened at the extreme base and the apex, while those of *idaei* have the siphunculi uniformly dark in the early summer forms. Alatae of *ruborum* have the third antennal joint short and the fourth rather long; the fourth is in fact often longer than the third, and is at most only slightly shorter. This is a rather uncommon character. The third antennal joint bears 5–10 rather large round rhinaria, the fourth 0–3.

Documented British records of *A. ruborum* are as follows: (1) *Rubus fruticosus* s.l., Cambridge, 10.vi.48; (2) *Rubus fruticosus* s.l., Great Wilbraham, Cambs., 23.vi/2.vii.51; (3) *Rubus laciniatus* Willd., Woodbridge, Suffolk, 12.vii.52 (*H. L. G. S.*); (4) Reading, Berks., local on *Rubus fruticosus*, no date (*V. F. Eastop*).[4]

Measurements of single specimens:

Apt. viv. female (spring form): Body 2·22 mm., ant. flagellum 1·05 mm., flag. jt. ratios 18 : 12½ : 10½ : 6½ + 18, siphunculus 0·37 mm., cauda 0·20 mm., caudal hairs 8, apical joint of rostrum 0·14 mm., 2nd jt. hind tarsus 0·11 mm., longest hair on ant. III 19μ, articular diam. of III 22μ. (*Rubus fruticosus*, Cambridge, 10.vi.48.)

Al. viv female: Body 1·57 mm., ant. flagellum 1·03 mm., flag. jt. ratios 13½ : 14½ : 11 : 6½ + 19, siphunculus 0·22 mm., cauda 0·13 mm., caudal hairs 8, apical jt. rostrum 0·13 mm., 2nd jt. hind tarsus 0·10 mm., secondary rhinaria on III 7 and 6, on IV 1 and 0. (*Rubus fruticosus*, Great Wilbraham, Cambs., 23.vi.51.)

Apt. viv. female (summer form): Body 0·86 mm., ant. flagellum 0·43 mm., flag. joint ratios 16 : 7 : 7 + 24, siphunculus 0·10 mm., cauda 0·09 mm., caudal hairs 4, apical joint of rostrum 0·08 mm., 2nd jt. hind tarsus 0·06 mm., longest hair on ant. III 7μ, articular diam. of ant. III 16μ. (*Rubus* x, "Veitchberry," Wageningen, Holland, 19.ix.50.)

48. *Aphis sarothamni* Franssen, 1928.

A small to medium-sized *Aphis* species living in rather dense colonies on the shoot apices, leaves and developing seed-pods of the common broom (*Sarothamnus scoparius*). Very closely related to *A. ulicis* Walker from gorse and *A. cytisorum* Hartig (*laburni* Kaltenbach) from laburnum, but generally smaller and less extensively pigmented than the latter.[5] From *ulicis* it may be separated by the lower range of variation in length of the apical rostral joint (0·13 to 0·16 mm. in *sarothamni*, 0·15 to 0·18 mm. in *ulicis*, apparently without overlap among specimens of comparable size). From *laburni* there is a less satisfactory diagnostic (Jacob, 1948) in the length of the apical rostral joint related to its basal width, the ratio of length to width being 1·65 to 2·10 in *sarothamni*, 2·00 to 2·20 in *laburni*.

Jacob (*l.c.*) in his careful account of the three species refers to *sarothamni* as known to occur in Britain, and supposes that part of Theobald's (1927) *laburni* Kaltenbach should be identical with *sarothamni*. Records in literature apart from this are, however, lacking up to the present, except for an undated record from Reading, Berks. (Eastop, 1951). The writer has found it numerous on *Sarothamnus* in several years (1949, 1951, 1953) at West Byfleet, Surrey. It will almost certainly prove to be widespread.

49. *Aphis schneideri* (Börner, 1940).

Börner (1940) described this aphid as *Doralina schneideri* with the bare diagnosis "Distinguished from *D. grossulariae* Kalt. by the long-haired appendages. *Ribes rubrum* and related species, not *grossularia*". Thomas (1948) quotes Hille Ris Lambers (*in litt.*) as regarding *schneideri* as a probable synonym of the North American *A. varians* Patch. Börner (1952) gives the further

[4] Dicker (1940) refers to *ruborum* as "an unnamed species" occurring on cultivated blackberry at East Malling, Kent, in 1937–39, apparently the earliest British record.

[5] In the writer's experience; Jacob (1948) considers the opposite to be the case for the pigmentation of both *ulicis* and *sarothamni*.

information that *schneideri* differs from *varians* in having longer hairs, a relatively shorter processus terminalis and a smaller average number of secondary rhinaria in the alatae.

Aphis schneideri is frequently very common and obnoxious as a pest of blackcurrants, particularly during the early part of the summer, when the apices of the shoots are heavily infested by the fundatrices and their progeny, with resultant curling of the leaves into crumpled nests. Ants, generally *Lasius niger*, visit the colonies eagerly.

The aphids are dark blue-green with a greyish wax bloom. Head, antennae and legs in fundatrices pale brownish sclerotic, darker towards apices of tibiae. Antennae 5-jointed, very short, processus terminalis not longer than basal part of VI. Siphunculi pale, rather broadened at base, about equal to or slightly longer than cauda. Hind tibiae rather incurved, generally with a small number (up to 6) of well-developed "sensoria" of the type found normally in oviparae. Succeeding generations of apterae with antennae, legs and siphunculi becoming progressively longer, the legs and antennae paler, and without tibial "sensoria." Alatae with sclerotic parts of thorax and head black; pattern of abdominal dorsum variable, segments 1–5 from completely membranous dorsally to completely ornamented with segmental bars or paired sclerites. Secondary rhinaria on joints III–V inclusive; antennae 6-jointed, processus terminalis 1·3–2·0 times basal part of VI. Marginal tubercles in both apterae and alatae prominent, on pronotum and abd. 1–5 and 7. Antennal and dorsal body hairs very long, fine and acute.

Separation of *A. schneideri* from the other closely related species of the *grossulariae* group—*grossulariae* Kltb., *praeterita* Wlk. (Börner, 1952) and *despecta* Wlk. (Börner, 1952)—is a simple matter. The antennal hairs of *schneideri* are exceedingly long, with a very fine, usually rather irregularly curved apical part the exact termination of which is very hard to see. These hairs on the third antennal joint are from a little less to considerably more than three times as long as the articular diameter of the joint. In the other species these hairs are always distinctly less than twice the articular diameter of III, and are without the extremely fine terminal part, the apices being acute but much more abrupt, and without any of the irregularity seen in *schneideri*. Apart from this the siphunculi and processus terminalis are shorter in *schneideri* than in the other species, relative to the size of the aphids.

The North American *Aphis varians* Patch and *A. neomexicana* Cockerell, both from species of *Ribes*, do in fact appear to be somewhat different from *schneideri*, to judge from the descriptions of Gillette and Palmer (1932), though *neomexicana* appears to make a close approach to *grossulariae* Kaltenbach.

Records of *Aphis grossulariae* from black and red currants probably all refer to *schneideri* Börner, and the writer has also found it in midsummer on the ornamental *Ribes aureum* and *R. sanguineum*. The true *grossulariae* may also occur on *R. aureum*, specimens having been received from this host at Grantham in 1952, taken by Mr. H. Britten.

Measurements of single specimens:

Fundatrix: Body 2·11 mm., ant. flagellum 0·58 mm., flag. joint ratios 13 : $7\frac{1}{2}$: 8 + $7\frac{1}{2}$, siphunculus 0·18 mm., cauda 0·17 mm., caudal hairs 18, apical jt. rostrum 0·14 mm., 2nd jt. hind tarsus 0·10 mm., longest hair on ant. III 43μ, articular diam. of III 18μ. (*Ribes nigra*, West Byfleet, Surrey, 11.v.51.)

Apt. viv. female: Body 1·96 mm., ant. flagellum 0·92 mm., flag. jt. ratios 14 : 10 : 10 :

8½ + 15, siph. 0·30 mm., cauda 0·19 mm., caudal hairs 14, ap. jt. rostrum 0·15 mm., 2nd jt. hind tarsus 0·10 mm., longest hair on ant. III 54μ, articular diam. of III 18μ.

Al. viv. female : Body 2·13 mm., ant. flagellum 1·14 mm., flag. jt. ratios 19 : 14 : 12 : 10 + 16, siph. 0·26 mm., cauda 0·19 mm., caudal hairs 15, ap. jt. rostrum 0·15 mm., 2nd jt. hind tarsus 0·11 mm., longest hair on ant. III 61μ, articular diam. of III 18μ, secondary rhinaria on ant. III 14 and 16, on IV 8 and 6, on V 2 and 3 (total range for species : III 10–20, IV 2–11, V 0–3).

(Both viviparae from *Ribes nigra*, Cambridge, 8.vi.53.)

50. *Aphis scorodoniae* Del Guercio, 1911.

This, a green species with dark siphunculi and very short hairs, was described by Del Guercio (1911) from the Iberian Peninsula. On 24th June, 1950, the writer collected aphids from the stem bases of stunted and exposed *Teucrium scorodonia* growing on a steep and heavily rabbit-grazed slope on North Berwick Law, East Lothian. They were attended by a species of *Myrmica*. Only apterae were taken, and these were bright apple-green, yellowish around and behind the siphunculi, which were blackish. Deformation of the leaves of the *Teucrium*, referred to by Del Guercio, was not observed. It would seem that these aphids should be *scorodoniae* Del Guercio, but they disagree in two respects with the original description. Del Guercio says of the rostrum that it does not reach beyond the middle coxae, and of the antennae that the third joint is equal to or longer than the siphunculi. In the North Berwick series the rostrum reaches beyond the middle coxae, and the third antennal joint is distinctly shorter than the siphunculi. The rostral length is usually a very constant character in aphids, and it might be supposed that the former difference indicated a second species ; but on the whole it is more probable that some of Del Guercio's preparations were mounted with the clypeal and labral regions of the head drawn forward, which would result in a similar drawing forward of the rostrum and make it appear shorter in relation to the coxae. One or two of the writer's specimens exhibit this. In view of the fate of Del Guercio's collections such a point cannot now be proved. The antennal joint character is one which cannot be considered trustworthy in a genus as variable as *Aphis* L. On the whole, therefore, it is preferable to identify the British aphids with *scorodoniae*.

Mr. J. P. Doncaster has subsequently found material, which was darker in colour and not attended by ants, on *Teucrium* on a wall in Cumberland. He considers the two samples to be conspecific.

Measurements of one specimen :

Apt. viv. female : Body 1·61 mm., ant. flagellum 0·89 mm., flag. joint ratios 14½ : 11 : 9 : 6 + 15, siphunculus 0·25 mm., cauda 0·14 mm., caudal hairs 7, apical joint of rostrum 0·13 mm., 2nd jt. hind tarsus 0·09 mm., marginal tubercles on abd. 1–3 and 7, longest hair on ant. III 12μ, articular diameter of III 18μ. (*Teucrium scorodonia*, North Berwick, E. Lothian, 24.vi.50.)

51. *Aphis taraxacicola* (Börner, 1940).

Originally placed in *Doralina* Börner (1940) ; later (Börner, 1952) reassigned to *Toxopterina*, subgenus *Tuberculaphis* Börner (*vide A. crepidis, lambersi*). The original description runs :

"Dark to leaf green, often mottled. Appendages very short-haired. Siphunculi of apterae 2¾ to 3½ times as long as hind tarsus, lengths of third to fourth antennal

joints = 4 : 3. Very like No. 53 (*A. lambersi* Börner). Rosette leaves of *Taraxacum* rarely *Leontodon*."

The reference to *Leontodon* refers presumably to the later-described *A. leontodontis* (Börner, 1950), since no reference is made to this host for *taraxacicola* in 1952.

The characters quoted by Börner in his diagnosis are in fact a good deal more variable than he indicates. Small specimens with 5-jointed antennae are frequent in late summer material, and these usually have the siphunculi not more than about two and a half times the second joint of the hind tarsi. Large spring examples, on the other hand, may have the siphuncular length up to three and three-quarters times the hind tarsus. The antennal joint proportions are also variable, and the ratio of III to IV is frequently up to about 3 : 2. Alatiform apterae with well-developed ocelli, heavy pigmentation and small marginal sclerites bearing the marginal tubercles, and a few secondary rhinaria on III, have been found in material from Hertfordshire in mid-summer.

For characters separating *taraxacicola* from *A. lambersi* see under the latter species. Apterae may be fairly reliably distinguished from those of *A. plantaginis* Schrank by the shorter tibial hairs, which on the outer side of the third quarter of the hind tibia are not more than one half of the tibial diameter in *taraxacicola*, but about equal to the diameter in *plantaginis*. In the material studied there is also a higher range of rhinarial numbers in alatae of *taraxacicola* than in those of *plantaginis*, but over larger numbers this may perhaps be found to break down. No satisfactory criterion has as yet been found for the morphological separation of *taraxacicola* from *A. crepidis* (Börner).

Aphis taraxacicola is widely distributed and will probably prove to be universally common. It is probable that Theobald (1927) had this species when he recorded *A. plantaginis* from *Leontodon taraxacum* (*sic*) and *A. gossypii* Glover from *Taraxacum dens-leonis*. British material in the writer's possession is from Hertfordshire, Cambridgeshire (two collections) and East Lothian. It has also occurred at Bangor, Caerns.

Measurements of single specimens :

Apt. viv. female : Body 2·18 mm., ant. flagellum 1·04 mm., flag. joint ratios 38 : 22 : 20 : 16 + 34, siphunculus 0·36 mm., cauda 0·18 mm., caudal hairs 10, apical joint of rostrum 0·14 mm., 2nd jt. hind tarsus 0·10 mm.

Al. viv. female : Body 1·87 mm., ant. flagellum 1·17 mm., flag. jt. ratios 39 : 27 : 24 : 16 + 40, siph. 0·30 mm., cauda 0·16 mm., caudal hairs 11, ap. jt. rostrum 0·11 mm., 2nd jt. hind tarsus 0·10 mm., secondary rhinaria on ant. III 11 and 11, on IV 3 and 2.

(Both specimens from *Taraxacum*, Harpenden, Herts., June 1945.)

(*N.B.*—Nevsky (1951) has recently described a new species from Central Asia as *Cerosipha taraxacicola*. This is quite a different aphid from Börner's species, living on *Taraxacum kok-saghyz*, *T. hibernum* and *Aesculus hippocastanum* (ostensibly polyphagy, not heteroecy !). The colour is yellow, the siphunculi of the apterae are very short, about one-tenth of the body length and not much longer than the cauda ; and the alatae have only about two rhinaria on the third antennal joint. *Cerosipha taraxacicola* Nevsky appears very liable to become secondarily homonymous.)

52. *Aphis thomasi* (Börner, 1950).

Described by Börner (1950) as *Doralina thomasi*; later (1952) removed to *Cerosipha* Del Guercio, s.s. The original description is as follows:

"Distinguished from *D. confusa* Walk. (= *scabiosae* Schrk., nec Scop.) by the straw-yellow colour and by the siphunculi being darkened only at the apex. Hairs on all leg segments very short (in *confusa* the coxae and femora are long-haired). 1·1–1·4 mm. On *Scabiosa columbaria* and *ochroleuca*."

Aphids apparently referable to *thomasi* were collected by Mr. V. F. Eastop from *Scabiosa columbaria* near Cambridge in 1950. No further particulars of this occurrence are available at present; the material is in Mr. Eastop's collection.

53. *Aphis vaccinii* (Börner, 1940).

Described by Börner (1940) as *Doralis vaccinii*; in 1952 *Doralis* is sunk by Börner to the status of a subgenus of *Aphis* L. Hosts given by Börner include *Vaccinium uliginosum*, *V. myrtillus* and *Andromeda polifolia*. To these must be added the Blueberry, *Vaccinium vacillans* Kalm.

Fidler (1951) has given a detailed account of the finding of aphids answering to *vaccinii* on *V. vacillans* at Otley, Yorks., in 1949. A previous record from *Andromeda* at Thorne Waste in 1932 (*A. A. Dallman*) is also given, and detailed descriptions of the alate and apterous viviparous females and comparative notes on *A. vaccinii* and *A. callunae* Theobald follow. Reference may be made to this paper, which summarises all that is known of *A. vaccinii* in Britain at present.

(Footnote to *Aphis* L., 1758. Börner's subdivisions of the Linnaean genus *Aphis*, while of some convenience for practical purposes, are not considered to be taxonomically necessary. In so large a genus there will always be a temptation to raise homogeneous species-groups to generic status, but a comparison of their diagnostic features with those used in the definition of genera in other tribes should suffice to expose the hollowness of such a procedure.)

54. *Brachycolus cerastii* (Kaltenbach, 1846).

J. W. Heslop Harrison (1948) published a record of *Brachycolus stellariae* (Hardy) causing leaf deformation on *Cerastium* in the islands of Rhum, Tiree and South Uist. This record should presumably refer to *B. cerastii* (Kaltenbach), and if so is apparently only the second documented British record, the first being Hardy's observation of what he considered to be his *stellariae* ovipositing on *Cerastium triviale* (Hardy, 1850). *B. cerastii* is a very minute and inconspicuous species, and its tiny rose-like galls at the apices of shoots of *Cerastium* can easily be overlooked.

55. *Semiaphis pimpinellae* (Kaltenbach, 1843).

A small dull green species, appearing greyish in life due to wax pulverulence; causing an upward curl to the leaves of *Pimpinella saxifraga*, and later in the summer inhabiting the umbels.

Species of the genus *Semiaphis* are characterised by their small size, very short, rather tapering flangeless siphunculi, elongate triangular cauda and the typical distribution of

the marginal tubercles on the abdomen, which occur variably on the second to fifth segments inclusive, but with that on 5 always the most strongly represented, lying just anterolateral to the base of the siphunculus. In *S. pimpinellae* this pair of tubercles is very frequently the only pair present, but in some specimens those of the anterior segments are present also as very small papillae, or one or two may be only slightly smaller than those on 5. In *S. anthrisci*, Kaltenbach, not yet recorded from Britain, the tubercles are more strongly developed, and a complete series of them is frequently present.

Apterae of *pimpinellae* have the frons rather convex, with no apparent lateral antennal prominences. Antennae short, 5- or 6-jointed, from rather less to just more than one-third as long as the body. Head with a longitudinal pale stria on the vertex, otherwise blackish. Rostrum very short, not or hardly reaching second coxae, apical joint rather short and blunt. Mesothoracic furca with arms widely separated. Abdominal pattern confined to short median bars on (6) 7–8. Eighth tergite with 4 hairs. Cauda more than twice as long, and basally more than twice as broad as siphunculi, typically with 6 hairs. Antennae and legs brownish sclerotic, shafts of tibiae and third antennal joint often rather paler than remainder. Hind tibiae rather incurved. Chaetotaxy of first tarsal joints 3, 3, 2.

Alatae have the sclerotic bars across the seventh and eighth abdominal tergites extending right across, that on 7 taking in the spiracles. Small median sclerotic spots may also be present on 6, and marginal sclerites are present on 2–6 inclusive. The antennae bear a rather small number of irregular and rather protuberant secondary rhinaria mainly along one side of joints III–IV (V); numbers range from 16 to 25 on III, 3 to 5 on IV and 0 to 2 on V. The cauda in alatae is more acutely triangular than in the apterae.

S. pimpinellae is the only one of the six European species recognised by Börner which is as yet recorded from Britain. Kloet and Hincks (1945) place two species in *Semiaphis* which belong properly in *Hayhurstia* Del Guercio—*atriplicis* (L.) and *cucubali* (Passerini). All the true *Semiaphis* species live on Umbelliferae, either monoeciously or as secondary hosts. Theobald (1927) evidently knew nothing of the genus, as he placed *Semiaphis* Van der Goot as a synonym of his *Anuraphis* Del Guercio.

The only British record at present known is of apterae collected on *Pimpinella saxifraga* at Fulford Ings, Yorks., on 21.viii.48 (*J. H. Fidler*), and recorded in the *North Western Naturalist* for March–December of that year (Fidler, 1949). The descriptive notes above are from Swedish and Dutch material in the writer's collection.

Measurements of single specimens:

Apt. viv. female: Body 1·73 mm., ant. flagellum 0·67 mm., flag. joint ratios 13½ : 5½ : 6 : 5 + 12, siphunculus 0·07 mm., cauda 0·15 mm., caudal hairs 6, apical jt. rostrum 0·09 mm., 2nd jt. hind tarsus 0·11 mm. (*Pimpinella*, between Margraten and Gulpen, S. Limburg, Holland, 28.vi.49.)

Al. viv. female: Body 1·46 mm., ant. flagellum 0·97 mm., flag. jt. ratios 42 : 17 : 13½ : 11½ + 37, siphunculus 0·06 mm., cauda 0·12 mm., caudal hairs 6, ap. jt. rostrum 0·09 mm., 2nd jt. hind tarsus 0·10 mm., secondary rhinaria on ant. III 23 and 23, on IV 4 and 5, on V 0 and 1. (*Pimpinella*, Uppsala, Sweden, 11.viii.48.)

56. *Pterocomma tremulae* Börner, 1940.

Described by Börner (1940) as follows:

"Distinguished from *P. populeum* Kalt. and *P. pilosum* Buckt. by distinctly swollen siphunculi and numerous secondary rhinaria on third and a few on fourth antennal joints of alatae and apterae. *Populus tremula.*"

A large colony of this species was found by the writer at the base of a young clump of aspen suckers growing in woods at West Byfleet, Surrey, on 11.ix.50. The aphids lived under an earth shelter attended by *Lasius niger*. In colour they were olive-brown and fawn with pale wax-powdering on the abdominal intersegments, and pale straw-coloured siphunculi. Börner's description of the species is a little misleading, in that no aptera was found among the specimens taken which possessed any secondary rhinaria on ant. IV. Some alatae were also without rhinaria on IV. A further character for separation from *P. populeum*, not noted by Börner, is the number of secondary hairs on the apical rostral joint, which in *tremulae* is about 15, in *populeum* only about 8, arranged in rather regular lateral pairs.

Measurements of single specimens:

Apt. viv. female : Body 3·65 mm., ant. flagellum 1·49 mm., flag. joint ratios 33½ : 16½ : 17 : 9 + 17, siphunculus 0·29 mm., apical joint of rostrum 0·22 mm., 2nd jt. hind tarsus 0·18 mm., secondary rhinaria on ant. III 8 and 7.

Al. viv. female : Body 4·06 mm., ant. flagellum 1·90 mm., flag. jt. ratios 46½ : 22 : 21 : 11 + 18½, siphunculus 0·34 mm., cauda 0·18 mm., apical jt. rostrum 0·23 mm., 2nd jt. hind tarsus 0·19 mm., secondary rhinaria on ant. III 47 and 45, on IV 2 and 1.

(Both specimens from *Populus tremula*, West Byfleet, Surrey, 11.ix.50.)

57. *Plocamaphis görnitzi* Börner, 1940.

" Distinguished from *P. bituberculata* Theob. by the siphunculi being about ¼ longer than the hind tarsus, and large brown segmental pairs of dorsal sclerites. *Salix cinerea.* (= *P. flocculosa* Schout. nec Weed)." (Original description, Börner, 1940.)

In November, 1950, the writer received a sample of aphids from Mr. E. S. Brown of Haileybury and Imperial Service College, Hertford, which proved to be oviparae of *P. görnitzi*. They were collected by a member of the school natural history society, Mr. J. G. Laird, from *Salix repens* in an open heathy clearing in a wood at Hertford Heath. The first find was on 28.x.50, and Mr. Brown appended the following notes : " Fairly common on the ascending stems of the plant, principally on the main stem. Mainly full-grown, a few small ones also. Powdery white deposit on stem evidently produced by aphids. *Nov. 3rd :* Another visit showed them still to be there, quite numerous. Different sizes present, and eggs common." The colonies were very localised, and only occurred on two patches of *Salix* about 100 yards apart. Only very few living aphids were left by December 2nd.

The oviparae possess the same large paired dorsal sclerites described for the species by Börner. The siphunculi in the Hertford material are only a very little longer than the 2nd joint of the hind tarsi, not longer by one-quarter as indicated by Börner, presumably for viviparae. The antennae bear up to about 10 secondary rhinaria on the third joint, from just before one-third to the apex. The hind tibiae, which together with the rest of the legs are uniformly dark sclerotic, are somewhat thickened over the basal three-quarters, and bear numerous small pseudo-sensoria over the thickened part. (Plate III, fig. 3.)

Measurements of one specimen :

Ovip. female : Body 4·08 mm., ant. flagellum 1·90 mm., flag. jt. ratios 38 : 25 : 24 : 13 + 19, siphunculus 0·31 mm., cauda 0·21 mm., apical jt. rostrum 0·15 mm., 2nd jt. hind

tarsus 0·28 mm., secondary rhinaria on ant. III 7 and 7. (*Salix repens*, Hertford Heath, 24.xi.50.)

58. *Periphyllus californiensis* (Shinji, 1917).

Essig and Abernathy (1952) in their comprehensive study of North American and Far Eastern species of *Periphyllus*, stated that on various occasions the above species, first described as *Thomasia californiensis* from *Acer macrophyllum* in California (Shinji, 1917), but probably of Old World origin, had been found in quarantined material of *Acer* spp. imported to America from England and Holland. This was the first intimation that *californiensis* existed in Europe. In 1953 Mr. J. P. Doncaster identified alatae taken on *Acer palmatum* at Wimbledon, Surrey, on 28.iv.53 (*N. D. Riley*) as *californiensis*. The writer is much indebted to Mr. Doncaster for the opportunity to examine two of these spring alatae. In view of the exhaustive description of Essig and Abernathy some brief comparative notes on these and the corresponding forms of *P. testudinatus* (Thornton) and *P. aceris* (L.) will suffice here. These are best shown in tabulated form.

	californiensis.	*testudinatus.*	*aceris.*
Colour of hind tibia	Uniformly dark	Pale, apex darkened	Uniformly pale
Number of hairs across bar on abd. 5T .	10–11	6	10–11
Proc. term./VIb	1·6–1·9	±3·0	1·9–2·5
Sec. rhinaria on ant. III . . .	7–9	16–24	9–12
Longest hair on III	0·18 mm.	0·11 mm.	0·24 mm.
Longest hair on VIb	58–84 μ	32 μ	95–110 μ
Adrhinarial hair, VIb	11–13 μ	18 μ	29–36 μ
Pterostigma	Pale	Pale	Dark

The fundatrix has only about 3 hairs on ant. III, of which the longest is not more than twice the articular diameter ; a single one by the primary rhinarium on V, about one and a half times the articular diameter ; and two small ones on VI, about half the articular diameter. The pleural hair-bearing scleroites of the abdomen are reduced to 1–2 on each side per segment (about 3 each side in *testudinatus*, numerous small accessory ones in *aceris*). (Data from one specimen.)

Periphyllus californiensis has been recorded from rather a large number of *Acer* species (Essig and Abernathy list *A. circinatum*, *A. negundo*, *A. palmatum*, *A. macrophyllum*, *A. miyabei*, *A. japonicum*, *A. campestre* and *A. carpinifolium*), and once from the California buckeye, *Aesculus californica*. Its polyphagous tendencies would therefore seem to be similar to those of *P. testudinatus* (Thornton), which in addition to *Acer* spp. can also colonise *Aesculus hippocastanum*. How wide the distribution of *californiensis* may be in Europe remains to be established. *Periphyllus* alatae with dark hind tibiae and a short processus terminalis should be carefully examined. The summer is passed as aestivating dimorphs, which bear foliate hairs like those of *testudinatus*, but have a less complete tortoise-shell pattern on the dorsum.

Measurements of one specimen :

Al. viv. female (*2nd generation*) : Body 3·30 mm., ant. flagellum 1·54 mm., flag. joint ratios 38 : 20 : 16½ : 8 + 14, siphunculus 0·17 mm., apical joint of rostrum 0·14 mm., 2nd jt. hind tarsus 0·17 mm., secondary rhinaria on ant. III 7 and 8. (*Acer palmatum*, Wimbledon, Surrey, 28.iv.53.)

59. *Chaetosiphella berlesei* (Del Guerico, 1904).

This small bristly aphid (Plate II, figs. 3 and 4) when alive bears a strong resemblance to a small Dermestid larva, and very little to an aphid. It lives on the blades of *Aira* (*Deschampsia*) *flexuosa*, usually in arid open heathy spots, but the writer has also thrashed specimens from *Aira* growing more luxuriantly in a small hollow in a pinewood in the Nature reserve of De Hoge Veluwe, Holland. The genus *Chaetosiphella* H. R. L. was erected for *berlesei* (Hille Ris Lambers, 1939*b*) on account of the very long acute apical joint of the rostrum, which is considerably longer than the third antennal joint. This character is well shown in the photograph of the larva (fig. 4).

Wood-Baker (1953) records a vagrant alata of this species taken on oak at Fota, Cork, on 14.vi.40. This is the sole record of its occurrence in the British Isles at present.

Measurements of one specimen:

Apt. viv. female : Body 1·86 mm., ant. flagellum 0·34 mm., flag. joint ratios 18 : 8 : 10 + 7, apical joint of rostrum 0·20 mm., 2nd jt. hind tarsus 0·13 mm., longest hair on ant. III 75μ, length of marginal spines on abdomen 0·19–0·20 mm. (*Aira flexuosa*, De Hoge Veluwe, Arnhem, Holland, 23.viii.51.)

60. *Saltusaphis intermedia* Hille Ris Lambers, 1939.

This species, described by Hille Ris Lambers (1939*b*) from *Carex hirta*, is indicated by him in a key to the Western European species as the only *Saltusaphis* with a mixture of normal spiny hairs among the mushroom-shaped microchaetae of the abdominal dorsum. Börner (1940) described *Saltusaphis cinerea* from *Carex riparia* as having the same character.

Eastop (1951) records *Saltusaphis intermedia* from Berkshire with the data "*Carex vesicaria*, R(eading), r(are)." These specimens have not been seen by the writer, and the record is accordingly given here without comment.

61. *Calaphis minutissima* Stroyan, 1953.

Vide Stroyan (1953) for full description. Börner (1952) erroneously and prematurely dates publication of the species from 1952. He indicates further records of the species from Berlin (*W. Quednau*) and Bohemia (*A. Pintera*). No more British collections have been made.

62. *Tinocallis platani* (Kaltenbach, 1843).

This beautiful aphid is the *Callipterus elegans* of Koch (1855). Kaltenbach's name is misleading, as the species is attached to *Ulmus* species and not to *Platanus*. The figures on Plate III will suffice for the recognition of *T. platani*, the dorsal abdominal pattern and heavily clouded wing-veins being quite characteristic. (Plate III, figs. 1 and 2).

Wood-Baker (1953) records *T. platani* from leaves of both *Ulmus* and *Quercus cerris* on Hampstead Heath, 18.vi.44, and adds "Very numerous alatae". Previous records of *platani* in Britain appear to be lacking. Material in the writer's possession was collected from *Ulmus montana* in Guernsey, 18.vi.51 by Mr. V. F. Eastop (*vide* Eastop, 1953*a*); it is from this that the measurements given below are taken.

Measurements of one specimen :

Al. viv. female : Body 2·40 mm., ant. flagellum 1·69 mm., flag. joint ratios 95 : 47 : 40 : 24 + 5, siphunculus 0·11 mm., cauda 0·15 mm., apical joint of rostrum 0·15 mm., 2nd jt. hind tarsus 0·12 mm., secondary rhinaria on ant. III 18 and 17.

63. *Pterocallis maculata* (von Heyden, 1837).

Börner (1949) separates the two *Pterocallis* species living on *Alnus glutinosa* in a key as follows :

" 5 (6) Third antennal joint of apterae and larvae with 2 large hairs, the distal one before the middle of the joint, remaining hairs of the joint much smaller, in the alatae inconspicuous. Antennae of apterae from about 3/5 to 4/5 body length, joints III–VI about 3/2 times hind tibia. Whitish or yellowish green, not or only weakly marked. 1·7–2·0 mm. Underside of leaves, living singly . . . . . **alni** Deg., 1773.

" 6 (5) Third antennal joint of apterae and larvae with (as a rule) 3 large hairs, the third being on the distal half of the joint, remaining hairs also stout, and antennae of alatae also with distinct hairs. Antennae of apterae about half body length, joints III–VI 8/7–9/7 times hind tibia. Leaf-green to ochreous straw coloured, usually distinctly banded with dark green to blackish green, pale transverse bars in apterae on posterior half of thorax and abd. 3–4. 1·7–2·1 mm. Living in colonies, by preference on the underside of leaves along the main veins, also on the upperside **maculata** v. Heyd., 1837."

Colonies of *P. maculata* were found clustering along the midribs on the underside of the leaves of a small bush of *Alnus glutinosa* at Barton Mills, Suffolk, on 7.ix.49. The colonies were attended by *Lasius niger*. Apterous viviparae, oviparae and apterous males were collected. The colour notes on this material read :

" Oviparae pale green with darker bar across middle of abdomen and more dark markings posteriorly ; males marked similarly but in ochreous and ferruginous brown. Body hairs long and black. Antennal joints black-tipped." (*H. L. G. S.*)

The morphological characters of this material agree well with those indicated by Börner for *maculata*. Oviparae have the hind tibiae moderately thickened, tapering off from one-half to about two-thirds, thereafter normally slender ; the thickened basal half with up to about 50 pseudo-sensoria. Apterae may occasionally have one or two secondary rhinaria on the basal part of ant. III. The apterous males have rather large secondary rhinaria disposed in a single row along joints III–V inclusive, III having 6–9, IV 2–4 and V 2–4. (Plate II, fig. 6.)

No further records of *P. maculata* are known at present, but it is possible that some of the apterae described by Theobald as showing deep green to brown lateral markings and one or two broken dark areas across the abdomen (Theobald, 1927) may be not *alni* but *maculata* ; against this must be set his statement that *alni* occurs " in small numbers, never in dense colonies ".

Measurements of single specimens :

Apt. viv. female : Body 1·39 mm., ant. flagellum 0·74 mm., flag. joint ratios 32 : 19 : 20 : 15 + 7, siphunculus 0·06 mm., cauda 0·06 mm., apical joint of rostrum 0·11 mm.,

2nd jt. hind tarsus 0·11 mm., longest hair on ant. III 44μ, articular diameter of joint 13μ, dorsal body hairs up to 0·14 mm. (Text-fig. 3.)

Ovip. female : Body 1·55 mm., ant. flagellum 0·75 mm., flag. joint ratios 35 : 18 : 18: 15 + 8, siphunculus 0·06 mm., cauda 0·08 mm., apical joint of rostrum 0·11 mm., 2nd jt. hind tarsus 0·12 mm., longest hair on ant. III 59μ, articular diameter of joint 15μ, dorsal body hairs up to 0·14 mm.

Apt. male : Body 1·17 mm., ant. flagellum 0·77 mm., flag. jt. ratios 36 : 20 : 18 : 14 + 8, apical joint of rostrum 0·11 mm., 2nd jt. hind tarsus 0·11 mm., longest hair on ant. III 59μ, articular diameter of joint 15μ, dorsal body hairs up to 0·12 mm., secondary rhinaria on ant. III 7 and 8, on IV 3 and 4, on V 2 and 4 (on VIb 0 and 1—an abnormal occurrence).

(All material from *Alnus glutinosa*, Barton Mills, Suffolk, 7.ix.49.)

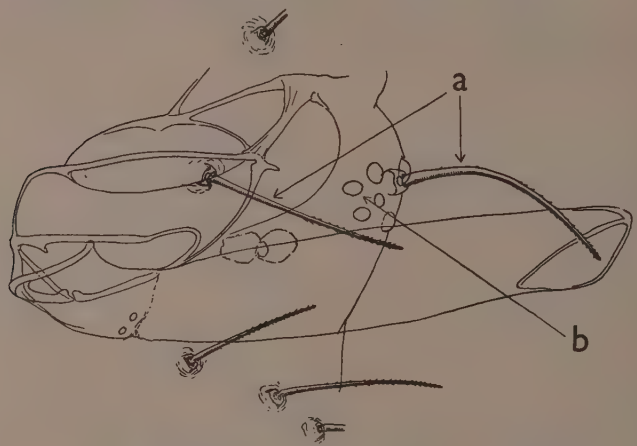

Fig. 3.—*Pterocallis maculata* (von Heyden). Detail, from cleared specimen, of margin of pronotum, showing (*a*) plumose dorsal body hairs and (*b*) "facetted" group of prothoracic marginal tubercles. Scale is given by the ventral details of front coxa, trochanter and femur.

64. *Therioaphis subalba* Börner, 1949.

Theobald (1927) and Wood-Baker (1953) have recorded *Therioaphis ononidis* (Kaltenbach) from clover in Britain. Börner (1949) described several new species and three new genera of this group of aphids. Of these species four—*Triphyllaphis luteola* Börner, *Pterocallidium lydiae* Börner, *P. propinquum* Börner, and *Therioaphis subalba* Börner—live on species of *Trifolium*. *Triphyllaphis* and *Pterocallidium*, two of the new genera, are distinguished from *Therioaphis* by the presence of pleural capitate hairs arising from conical tubercles on the first 4–5 abdominal tergites. Through the kindness of Mr. J. P. Doncaster the writer has been able to examine the only Theobald slide of clover material in the British Museum collection. It is a badly cleared and mounted ovipara, collected at Rothamsted in 1910. It is however possible to see that the pleural hairs are absent from the abdominal tergites. The apical joint of the rostrum is shorter than in *ononidis* (0·09 mm. against 0·13–0·14 mm.), and the small size of the conical tubercles bearing the dorsal body hairs agrees with the description of *Therioaphis subalba*, described by Börner from *Trifolium alpestre* in the Eastern Alps and Thuringia. Dr. Wood-Baker's

specimen, which he has kindly sent for examination, is a last instar larva, but appears to belong also to the same species as Theobald's. It is possible that there are other undescribed species on *Trifolium*, so the ascription of the two records to *subalba* is at present tentative.

65. *Drepanosiphum gracilis* Börner, 1940.

"Spinal and pleural hairs of young larva (in contrast to *D. acerinus* Walk. and *D. platanoides* Schrk.) very small from vertex of head to 4th and 5th abdominal segments, later elongate and similar to marginal hairs. Tibiae distinctly spinulose up to the knee-joints, short-haired. Whitish yellow. Viviparae with a narrow black transverse band between the siphunculi and a pair of black spots lateral to their bases. Fore wing 3–4 mm., body length $2\frac{1}{2}$–$3\frac{1}{4}$ mm. *Acer pseudoplatanus*." (Original description, Börner, 1940.)

Dr. Hille Ris Lambers collected material of this species from sycamore growing in deep shade at Harpenden, Herts., on 27.vii.49. The writer has four imperfect specimens from this material. The insects appear more slender and delicate than *D. platanoides* (Schrk.), and are much less pigmented; but morphologically the adults overlap those of *platanoides* to a considerable extent. The tibial spinulosity is a hard character to evaluate, as in both species the size and number of the spinules decrease from apex to base, and on the extreme basal part only a very few extremely fine ones are left between the hairs. Those of *gracilis* are certainly on the whole more conspicuous than those of *platanoides*, but the character cannot be regarded as diagnostic.

Pigmentation is also a doubtful ground for separation, since the black markings referred to by Börner are partly or wholly absent in two out of the four specimens mentioned above, and a basal black spot by the siphunculi also often occurs in pale specimens of *platanoides*. However, the antennae of *platanoides* are always rather brownish pigmented, deepening towards the apex, while in the specimens of *gracilis* seen so far they are quite pale, deepening only to straw-yellowish apically. Further, the knees of the mid- and hind tibiae of *platanoides* are always distinctly pigmented, while those of *gracilis* are nearly always (those of the mid-tibiae always ?) entirely pale. Secondary rhinaria in alatae examined range from 10–15 on III in *gracilis*, and from 13–21 in *platanoides*. These characters may however prove unreliable over larger samples of *gracilis*.

Measurements of one specimen:

Al. viv. female: Body 2·39 mm., ant. III 1·25 mm., IV 0·90 mm. (V and VI missing), siphunculus 0·62 mm., cauda 0·14 mm., apical joint of rostrum 0·11 mm., 2nd jt. hind tarsus 0·14 mm., sec. rhinaria on ant. III 14 and 13. (*Acer pseudoplatanus*, Harpenden, Herts., 20.vii.49.)

66. *Trama rara* Mordvilko, 1908.

Distinguished from *T. troglodytes* von Heyden (*sensu latiori*, Eastop, 1953*b*) by the possession of multi-facetted compound eyes by the apterous viviparous females (*T. troglodytes* has only a triommatidion), and by the hind tarsus/hind tibia ratio of the apterae, which ranges from 0·84 to 0·92 as against 0·65 to 0·82 for normal apterae of *troglodytes*. It should be noted that alatiform apterae of *troglodytes* may have multi-facetted compound eyes, but in such cases the hind tarsus/hind tibia ratio gives values of less than 0·80.

Trama rara lives apparently only on *Taraxacum*, or if on other Compositae (Mordvilko (1935) gives *Helianthus*, *Cichorium* and *Centaurea*) then only rarely. In Britain it has been found at Wheathamsted and Harpenden, Herts., and Reading, Berks. For details of these records, and for biometric data from British and foreign material, see Eastop (1953*b*).

Trama oculata Gillette and Palmer, 1930, is a synonym.

67. *Protolachnus bluncki* (Börner, 1940).

"Dorsal hairs of apterae pointed apically, still longer than in *E(ulachnus) agilis* Kalt. Dirty olive-brown with loose wax-coating. Needles of *Pinus austriaca*." (Original description as *Eulachnus bluncki* sp. n. (Börner, 1940).)

This species occurs abundantly from time to time on *Pinus nigra* (*austriaca*) in the University Botanic Garden, Cambridge. It is probably widespread where the Austrian Pine is planted for decorative or utilitarian purposes. In life the species is at once recognisable by its wax-coating and brownish colour, *P. agilis* (Kaltenbach) and *P. brevipilosus* (Börner) on *Pinus sylvestris* being both nude green species.

The adoption of *Protolachnus* Theobald instead of *Eulachnus* Del Guercio for this species, *agilis* and *brevipilosus* is undoubtedly correct, since *agilis* Kaltenbach, adopted as the type of *Eulachnus* by Wilson (1911), is in fact the only species placed in *Eulachnus* by Del Guercio which does not agree with his own diagnosis, which indicates that the rostrum should have a lancet-shaped apical joint! *Protolachnus*, with type *P. tuberculostemmata* Theobald, is the first available name for *Eulachnus* Wilson nec Del Guercio (*vide* Börner, 1952).

Measurements of single specimens:

Apt. viv. female: Body 2·50 mm., ant. flagellum 1·26 mm., flag. joint ratios 26 : 17 : 20½ : 11 + 4½ (processus measured from distal border of accessory rhinaria, *not* from the distally displaced primary rhinarium of VI), apical joint of rostrum 0·10 mm., 2nd jt. hind tarsus 0·23 mm., longest hair on ant. III 0·15 mm., tibial and dorsal body hairs to 0·16 mm. (*Pinus nigra* var. *calabrica*, Cambridge, 9.x.50.)

Al. viv. female: Body 2·28 mm., ant. flagellum 1·50 mm., flag. joint ratios 32½ : 20½ : 24 : 12 + 5, apical joint of rostrum 0·11 mm., 2nd jt. hind tarsus 0·24 mm., longest hair on ant. III 0·11 mm., tibial hairs to 0·14 mm. (Vagrant, Cambridge, 1.viii.47.)

Al. male: Body 2·18 mm., ant. flagellum 1·63 mm., flag. joint ratios 38 : 22 : 25 : 12 + 5, apical joint of rostrum 0·11 mm., 2nd jt. hind tarsus 0·13 mm., longest hair on ant. III 0·11 mm., tibial hairs to 0·14 mm., dorsal abdominal hairs to 0·12 mm., secondary rhinaria on ant. III 85 and 86, on IV 34 and 29, on V 19 and 20, on VI 4 and 3. (*Pinus nigra* var. *calabrica*, Cambridge, 9.x.50.)

Ovip. female: Body 2·01 mm., ant. flagellum 1·08 mm., flag. jt. ratios 23½ : 14 : 17 : 9 + 4, apical joint of rostrum 0·10 mm., 2nd jt. hind tarsus 0·21 mm., longest hair on ant. III 0·11 mm., tibial hairs to 0·15 mm., dorsal body hairs to 0·12 mm., pseudo-sensoria on thickened hind tibiae 91 and 80 (approximate count). (*Pinus nigra* var. *calabrica*, Cambridge, 9.x.50.)

Further British records are of vagrant alatae (1) swept from grass beneath *Pinus sylvestris*, Easton Broad, Southwold, Suffolk, 2.vii.48 (*H. L. G. S.*); and (2) *Agropyron* sp., Waddesdon, Bucks., 6.ix.52 (*V. F. Eastop*).

68. *Protolachnus brevipilosus* (Börner, 1940).

"Distinguished from *E(ulachnus) agilis* Kalt. by the very short blunt hairs on the dorsum and appendages. Needles of *Pinus silvestris*." (Original description, Börner (1940).)

No further diagnosis of this species is required. *P. brevipilosus* seems likely to be at least as common on Scots pine in Britain as *P. agilis* (Kltb.). Part of the material labelled *agilis* in the Theobald collection in the British Museum (Natural History), a sample taken at Woking, Surrey, on 19.iv.13, is *brevipilosus*. There is also a mixed slide of *agilis* and *brevipilosus* taken at Barton Mills, Suffolk, 17.vi.36, among aphids collected by Prof. E. O. Essig of Berkeley, California, and deposited in the Museum of Zoology, Cambridge University. The writer has collected *brevipilosus* from *Pinus sylvestris* near Southwold, Suffolk, 2.vii.48, and at West Byfleet and Horsell, Surrey, 17/18.iv.49. An alate viviparous female was taken flying at Barkway, Herts., 10.vi.49.

Measurements of single specimens :

Apt. viv. female : Body 2·06 mm., ant. flagellum 0·56 mm., flag. joint ratios 12½ : 5 : 8 : 6½ + 3, apical joint of rostrum 0·07 mm., 2nd jt. hind tarsus 0·18 mm., longest hair on ant. III 14μ, blunt outer tibial hairs to 22μ, dorsal body hairs to 11μ. (*Pinus sylvestris*, West Byfleet, Surrey, 18.iv.49.)

Al. viv. female : Body 1·84 mm., ant. flagellum 0·65 mm., flag. joint ratios 15½ : 6½ : 8½ : 7 + 3, apical joint of rostrum 0·07 mm., 2nd jt. hind tarsus 0·18 mm., longest hair on ant. III 18μ, blunt outer tibial hairs to 65μ, dorsal body hairs to 14μ, secondary rhinaria on ant. III 2 and 1. (Vagrant, Barkway, Herts., 10.vi.49.)

69. *Cinara laricicola* Börner, 1939.

" With the typical characters of the genus (the vertical line from the articulation between the tarsal joints cuts the sole of the first joint at about 2/3 to 3/4 of its length ; no mesosternal tubercle ; mesothoracic furca short-stemmed). Most nearly related to *C. taeniata* Koch, the hairs are throughout shorter, the dorsal body hairs are exceptionally short (in *taeniata* of normal length). Metathorax and first abdominal segment in apterae with dark dorsal bars. Siphunculi small. To 3½ mm. On young shoots of larches." (Original description, Börner, 1939.)

This species occurs in small numbers on *Larix decidua* in the University Botanic Garden, Cambridge. Males were reared from nymphs collected in October, 1950. The identity of the aphids was confirmed by Dr. V. Pašek of Banská Stiavnica, Czechoslovakia. The male is alate, with a very large number of rather small circular rhinaria thickly adorning the third to fifth antennal joints. Apterae vary, according to the writer's colour notes, from dark brown to orange-reddish with dark blackish-green segmental markings, and in life have a slight wax bloom with a tendency to form transverse pleural bands on the abdomen. Ants were not noted in attendance on the aphids.

Measurements of single specimens.

Apt. viv. female : Body 3·51 mm., ant. flagellum 1·37 mm., flag. joint ratios 37½ : 16 : 20 : 10 + 2, diam. of siphuncular cone 0·19 mm., apical joint of rostrum 0·18 + 0·08 mm., 2nd jt. hind tarsus 0·38 mm., hairs on ant. III to 24μ, artic. diam. of III 32μ, spinal hairs on mid-dorsum to 25μ, femoral and tibial hairs 20–50μ, secondary rhinaria at apex of ant. V 1 and 1. (*Larix decidua*, Cambridge, 25.ix.53.)

Male : Body 2·72 mm., ant. flagellum 1·35 mm., flag. joint ratios 33 : 17 : 21½ : 10 + 3, diam. of siphuncular cone 0·20 mm., apical jt. rostrum 0·16 + 0·06 mm., 2nd jt. hind tarsus 0·35 mm., sec. rhinaria on ant. III 106 and 109, on IV 34 and 34, on V 19 and 18. (*Larix decidua*, Cambridge, 12.x.50.)

70. *Cinara montanicola* Börner, 1939.

"Most closely related to *C. nuda* Mordw. (*pini* Koch, Braun) and with the typical characters of the new genus (summer apterae with a blunt median tubercle at the anterior margin of the mesosternum, first tarsal joint somewhat smaller than in *Cinara*: mesothoracic furca sessile with a transverse slit opening or with separated arms). The mesosternal tubercle is hairless as in *nuda* and *laricis*. The two dorsal sclerites on the first abdominal segment in apterae are always separate, the 2nd and 3rd segments without sclerites (in *nuda* sclerites of decreasing size present to the 3rd segment, those on first usually fused). Siphunculi smaller than in *nuda*. On bark of older twigs of *Pinus montana* (*nuda* occurs only on *P. silvestris*.)" (Original description, Börner, 1939.)

C. montanicola occurred in vast numbers, mixed with *Protolachnus bluncki* (Börner), on specimen trees of *Pinus nigra* var. *calabrica* in the Cambridge University Botanic Garden, 9.x.50. The material collected consisted almost entirely of oviparae, with a very small number of slender apterous males. The species was sent for determination to Dr. Pašek, who at first considered them to be his *polyseta* (*in litt.*, a form which he later abandoned as a synonym of *nuda* (Mordvilko)); but in a more recent letter to the writer he changed this identification to *montanicola* Börner.

In life the aphids were dark brown with white lateral areas of wax marking on the dorsum. The male has one or two small secondary rhinaria at the apex of ant. III, a rather more numerous group at the apex of IV and three or four larger ones mixed with an odd small one along V. The hind tibiae of the oviparae are not appreciably thickened and bear no pseudo-sensoria.

The relationship between *montanicola* and *nuda* is clearly very close; available material is insufficient to be certain whether the differences between them are worthy of more than subspecific rank. Ecologically they would appear to replace each other on their respective hosts. In Britain *montanicola* must necessarily be restricted in its range to plantations or arboreta.

Among predators attacking the very large numbers of aphids in the Cambridge Botanic Garden were small numbers of the rather recently introduced Coccinellid, *Coccinella quadripunctata* Pont., so far only recorded from Suffolk, Berkshire and Cambridgeshire.

Measurements of single specimens:

Male: Body 2·69 mm., ant. flagellum 1·13 mm., flag. joint ratios 28 : 14 : 17½ : 9 + 2, max. diam. of siphuncular cone 0·34 mm., apical joint of rostrum 0·19 + 0·10 mm., 2nd jt. hind tarsus 0·23 mm., longest hair on ant. III 0·09 mm., secondary rhinaria on ant. III 1 and 1, on IV 5 and 7, on V 4 and 5. (*Pinus nigra* var. *calabrica*, Cambridge, 9.x.50.)

Ovip. female: Body 3·42 mm., ant. flagellum 1·22 mm., flag. joint ratios 60 : 37 : 37 : 17 + 5, max. diam. of siphuncular cone 0·44 mm., apical joint of rostrum 0·22 + 0·11 mm., 2nd jt. hind tarsus 0·24 mm., longest hair on ant. III 62μ, articular diam. ant. III 33μ, longest spinal hair on abd. 3 49μ, sec. rhinaria on ant. V 1 and 1. (*Pinus nigra* var. *calabrica*, Cambridge, 9.x.50.)

Note.—*Cinara* Curtis, type *Aphis pini* L., is here applied in the sense of Börner (1952). The opinion of Hille Ris Lambers (1948) that *pini* L., is the species called by Börner *nuda* Mordvilko hinges on the acceptance of Degeer's synonymy of *pini* with his *nuda pini* rather than Fabricius' interpretation of *pini* as the species living on young branches of pine. The balance of probability between the two theories seems to be a fine one; but a careful perusal of Degeer's

account (1773) of *nuda pini* and an examination of his figures inclines the writer to believe that Degeer was not dealing with the same species throughout his account. Some of his colour notes and at least one of his figures (Pl. 6, fig. 8) agree better with *pini* F., Kltb., than with *nuda* Mordvilko. If he failed to realise that he was observing two species at different times his opinion on the synonymy of his *nuda pini* must be suspect; and for this reason the name *nuda* Mordvilko is here preferred to *pini* L. for Degeer's invalid trinomial species.

71. *Anoecia pskovica* Mordvilko, 1916.

This species already figures in the British list on the authority of Theobald (1929). According to Dr. Hille Ris Lambers Theobald's material was not true *pskovica*. Apterae of the real *pskovica* were collected from the roots of waterlogged *Carex panicea* at Tunley, near Sapperton, Glouc., by Dr. Hille Ris Lambers and Mr. A. W. McKenny Hughes on 24.vii.49. Slides from this material are in the writer's collection through the kindness of Dr. Hille Ris Lambers.

These apterae can be distinguished readily from all the other British forms of *Anoecia* by the extremely short and blunt unguis of the sixth antennal joint, which hardly projects beyond the very prominent and protruding primary rhinarium. They are also extremely pale in colour, the sclerotic pattern being hardly pigmented and restricted to the marginal sclerites, the head capsule and pale sclerotic bars across the pro- and mesonotum and eighth abdominal tergite. Legs and antennae pale brownish sclerotic. Antennae without secondary rhinaria except for a small one (occasionally two) at apex of IV which is a constant characteristic of apterous *Anoecia*. Antennal and body hairs all very fine and acute.

Measurements of one specimen:

Apt. vir. female: Body 2·30 mm., ant. flagellum 0·74 mm., flag. joint ratios 44 : 14 : 16 : 16 + 3, apical joint of rostrum 0·19 mm., 2nd jt. hind tarsus 0·15 mm., hairs on ant. III to 0·09 mm., articular diam. of ant. III 18μ, hairs on eighth abd. tergite to 0·13 mm. (*Carex panicea*, Tunley, Glouc., 24.vii.49.)

72. *Mimeuria ulmiphila* (Del Guercio, 1917).

First described by Del Guercio (1917) as *Neorhizobius ulmiphilus*. Börner (1952) erected the new genus *Mimeuria* for the species, and placed it in the Pemphigini on the structure of the empodial hairs. A valuable account of the species and its biology on *Ulmus* roots is given by Marchal (1933).

M. ulmiphila is remarkable in that the apterous forms live enveloped in brownish cysts composed of a fungal mycelium on the young rootlets of elm. Alate sexuparae are formed in autumn, but although Marchal obtained deposition of young sexuales on elm branches he was unable to demonstrate any completion of the cycle, and it remains uncertain whether the species can overwinter as eggs on any primary host at the present time. Marchal has suggested that the occurrence of the sexuparae is a vestigial phenomenon, and although this seems unlikely it is true that no known primary host form can be linked with the root forms of *ulmiphila* as possible links in the complete cycle.

The apterae on elm roots are peculiar among the Pemphigini in having one-jointed tarsi through the fusion of the two normal joints. The alatae have the typical Pemphigine wing venation with the wing veins rather markedly dusky-shadowed, and the antennae bear transverse granular-margined secondary rhinaria on joints III–V inclusive. In all forms the processus terminalis or

unguis of the apical antennal joint is reduced to vanishing point. Other characters are typical of Pemphigini.

The only known British record of this obscure aphid is of a single alate viviparous female trapped at Seale Hayne, Devonshire, and identified by Dr. Hille Ris Lambers.

IV. Appendix A.

Addenda and Amendments to Part I.

4. *Acyrthosiphon caraganae* (Cholodkovsky).

Found commonly on *Colutea* in the University Botanic Garden, Cambridge, 30.vii.53 (*H. L. G. S.*).

5. *A.* (*Lactucobium*) *scariolae* Nevsky.

The subgenus falls as a synonym of *Tlja* Mordvilko, 1914. Found commonly up the flower stems of *Lactuca virosa* at Orsett, Essex, 14.vii.50 (*H. L. G. S.*). *A. scariolae* seems to be the only species capable of infesting *L. serriola* and *virosa* without rupturing the plant's latex vessels and succumbing by being immobilised by large lumps of congealed latex on the tarsi. This is correlated, somewhat surprisingly, with a great reduction of the distensible pulvilli at the apices of the tibiae, suggesting that the operative factor in damaging the latex vessels of the plant is the area of contact between the aphids' feet and the cuticle of the plant.

6. *Cryptaphis setiger* Hille Ris Lambers.

Further records are: (1) roots of grass under old wood, Trumpington, Cambs., 27.i.51 (*V. F. Eastop*, see Stroyan, 1952); (2) stems of *Festuca* under stones, Dinnet Moor, Aberdeenshire, 5.vii.53 (*H. L. G. S.*). In its biology the species seems to resemble *Jacksonia papillata* Theobald very closely.

7. *Subacyrthosiphon cryptobium* Hille Ris Lambers.

Subsequently found and reared in small numbers on *Trifolium* by Mr. V. F. Eastop, at Waddesdon, Bucks., in 1952.

12. *Amphorophora gei* (Börner).

Further records are: (1) *Geum urbanum*, Upper Sheringham, Norfolk, 26.vi.52; (2) *Geum rivale*, Gleneagles, Perthshire, 7.vii.53 (*H. L. G. S.*).

13. *Megourella purpurea* Hille Ris Lambers.

Further records are: (1) Hauxton Mill, Cambs., fairly common on *Lathyrus pratensis*, 14.viii.50 and 3.vi.52 (*H. L. G. S.*); (2) *Lathyrus pratensis*, Saredon, near Shareshill, Staffs., vii/viii.53 (*D. W. Empson*).

14. *Rhopalosiphoninus* (*Submegoura*) *obscurata* H. R. L.

Owing to delay in publication of the description of this species the name *obscurata* is pre-dated by *Myzotoxoptera heikinheimoi* Börner, 1952, and becomes accordingly *R.* (*S.*) *heikinheimoi* (Börner).

21. *Anuraphis catonii* Hille Ris Lambers.

Since taken from *Pimpinella saxifraga* in the Isle of Thanet, 13.vii.50 (*D. W. Empson* and *H. L. G. S.*).

22. *Acaudinum centaureae* (Koch).

Further records: (1) *Centaurea scabiosa*, Isle of Thanet, 13.vii.50 (*D. W. Empson*); (2) *C. scabiosa*, near Barton Mills, Suffolk, 21.v.52 (*H. Tambs-Lyche* and *H. L. G. S.*).

25. *Sappaphis hirsutissima* (Börner).

A considerable extension of the known range is provided by apterae collected from bases of *Anthriscus sylvestris*, Dundee, 1.vii.53 (*A. G. Fisken* and *H. L. G. S.*).

27. *Nasonovia pilosellae* (Börner).

The author's name requires parentheses, the species having been described in *Impatientinum* Mordv. Further records are: (1) *Hieracium lachenalii*, Holt, Norfolk, 26.vi.52; (2) *Hieracium pilosella*, Cambus o' May, Aberdeenshire, 4.vii.53 (*H. L. G. S.*).

28. *Cavariella archangelicae* (Scopoli).

An abundant infestation of this species was present on plants of *Angelica sylvestris* maintained in the insectary at the Entomological Field Station, Storey's Way, Cambridge, through the summer of 1952. Gynoparae have also been recorded from *Salix* in the University Botanic Garden, and it appears that the species is far from rare in Cambridge.

29. *Cavahyalopterus mühlei* (Börner).

The genus sinks as a synonym of *Brachycolus* Buckton. A very few apterae were collected from *Phleum pratense* at Clavering, Essex, 23.vii.53 (*H. L. G. S.*).

30. *Galiobium langei* (Börner).

Further records: (1) *Galium verum*, Quy, Cambs., 4.vi.52; (2) *G. verum*, Sheringham, Norfolk, 22.vi.52 (*H. L. G. S.*); (3) *G. saxatile*, Banchory, Kincardineshire, September, 1953 (*G. D. Morison*); (4) *Galium mollugo*, Midgham and Woolhampton, Berks., rare (*V. F. Eastop*, see Eastop (1951).)

31. *Stägeriella necopinata* (Börner).

Apterae and alatae were thrashed from *Galium verum* on sandhills at Aberdeen on 3.vii.53 (*M. W. Shaw* and *H. L. G. S.*). This is the first record for Scotland.

32. *Myzaphis bucktoni* Jacob.

One aptera and one alata were thrashed from *Rosa* sp. at Crathie, Aberdeenshire, 6.vii.53 (*H. L. G. S.*).

33. *Rhopalosiphum maidis* (Fitch).

Considerable numbers were collected from heads of *Setaria italica* in the University Botanic Garden, Cambridge, on 16.x.50 (*H. L. G. S.*). A culture was maintained for a time on *Hordeum murinum*, and a number of alatae obtained.

V. Appendix B.

The following two species, originally described from Great Britain, had not been recognised at the time of publication of Kloet and Hincks' *Check-list* (1945). They are thus not included in the list of aphids given in the Check-list, and although not new species to Britain may be mentioned here in brief in order to reintroduce them to the British fauna.

1. *Myzus certus* (Walker, 1849).

A species of the *persicae*-group, living holocyclically on *Viola arvense* and *V. tricolor*, where some leaf deformation is caused. The apterae are dirty brownish in colour, and the siphunculi are distinctly swollen in the spring generations. Börner (1952) records having found some sexuales on *Capsella* in 1951 which accepted *Viola* willingly as an alternative. For further particulars see Hille Ris Lambers (1946).

2. *Sappaphis devecta* (Walker, 1849).

Since the paper of Hille Ris Lambers (1945) on this species, its biology and relationship to other species such as *S. mali* (Ferrari) and *S. crataegi* (Kaltenbach) have become common knowledge to most advisory entomologists. A further account was published independently by Shaposhnikov (1950*b*); in this *S. devecta* is confused with the two closely related migratory species, *S. anthrisci* (Börner) and *S. choerophylli* (Börner). *S. devecta* is a widely distributed but not generally common species; material has been seen from the London area (Mill Hill and South Kensington), Manchester, Newcastle-on-Tyne and a number of localities in Cambridgeshire. In some East Anglian orchards it is a minor pest.

Postcript.

The descriptions of *Sappaphis maritima* H. R. L. and *S. gallica* H. R. L. have now been published (*Ent. Bericht.* **15**: 304–309).

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The photographs illustrating the paper are the work of Miss J. M. W. Hurrell, B.Sc., and Mr. P. M. Naylor, to whose assistance much is owed in the preparation of it.

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PLATE I.

FIG. 1.—*Dactynotus* (*Uromelan*) *riparius* sp. n. Apt. viv. ♀ (Type). *Crepis paludosa*, Crathie, Aberdeenshire. 6.vii.53.

FIG. 2.—*Dactynotus* (*Uromelan*) *riparius* sp. n. Al. viv. ♀. *Crepis paludosa*, Crathie, Aberdeenshire, 6.vii.53.

FIG. 3.—*Macrosiphum weberi* Börner. Apt. viv. ♀. *Succisa pratensis*, Dinnet Moor, Aberdeenshire, 4.vii.53.

FIG. 4.—*Macrosiphum weberi* Börner. Al. viv. ♀. *Succisa pratensis*, Dinnet Moor, Aberdeenshire, 4.vii.53.

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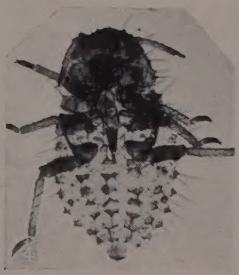
PLATE II.

Fig. 1.—*Aspidaphium cuspidati* sp. n. Apt. viv. ♀.
Fig. 2.—*Aspidaphium cuspidati* sp. n. Al. viv. ♀.
Fig. 3.—*Chaetosiphella berlesei* (Del Guercio). Apt. viv. ♀.
Fig. 4.—*Chaetosiphella berlesei* (Del Guercio). Larva.
Fig. 5.—*Schizaphis* (*Paraschizaphis*) *caricis* (Schout.). Apt. viv. ♀.
Fig. 6.—*Pterocallis maculata* (v. Heyden). Ovip. ♀.



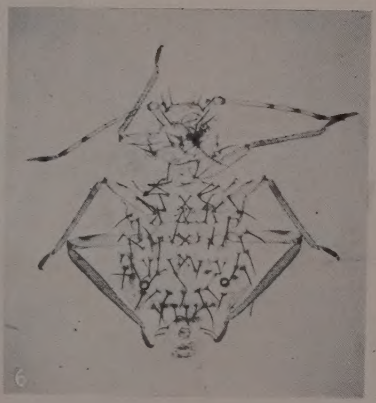


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PLATE III.

FIG. 1.—*Tinocallis platani* (Kaltenbach). Al. viv. ♀.
FIG. 2.—*Tinocallis platani* (Kaltenbach). Al. viv. ♀. Fore wing and apex of antenna.
FIG. 3.—*Plocamaphis görnitzi* Börner. Ovip. ♀.

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